COMMUNICATIONS

WORLD

REGISTERED BY AUSTRALIA POST – PUBLICATION No NBP 7891

INCORPORATING COMPUTERWORLD ON COMMUNICATIONS

SEPTEMBER 1986 The newspaper for communications users and managers ISSN: 0817-1904

Q-net's results boost morale

BRISBANE — Plans for the future development of Q-Net will be shortly considered by the Queensland Cabinet against a background of departmental enthusiasm for results from the initial phases.

Deputy director and chief executive officer of the Department of Industry Development, Douglas Rowell, said the results of the initial phases in terms of economic, social and communications cost/benefits had "proved even better than what I had expected".

Rowell said his personal remarks should not be interpreted as pre-empting any Cabinet decision as to future plans covering the next five to 10 years. When Phase II is completed by the end of next year, Q-Net would comprise 120 earthstations Statewide, with some 30 projects under trial including School of the Air, nursing and water resources.

The plans to be submitted included "much of the same" in these present applications, together with new ventures. Sufficient evidence had been gained to indicate which paths should be pursued, Rowell said.

Asynchronous access on Austpac soon

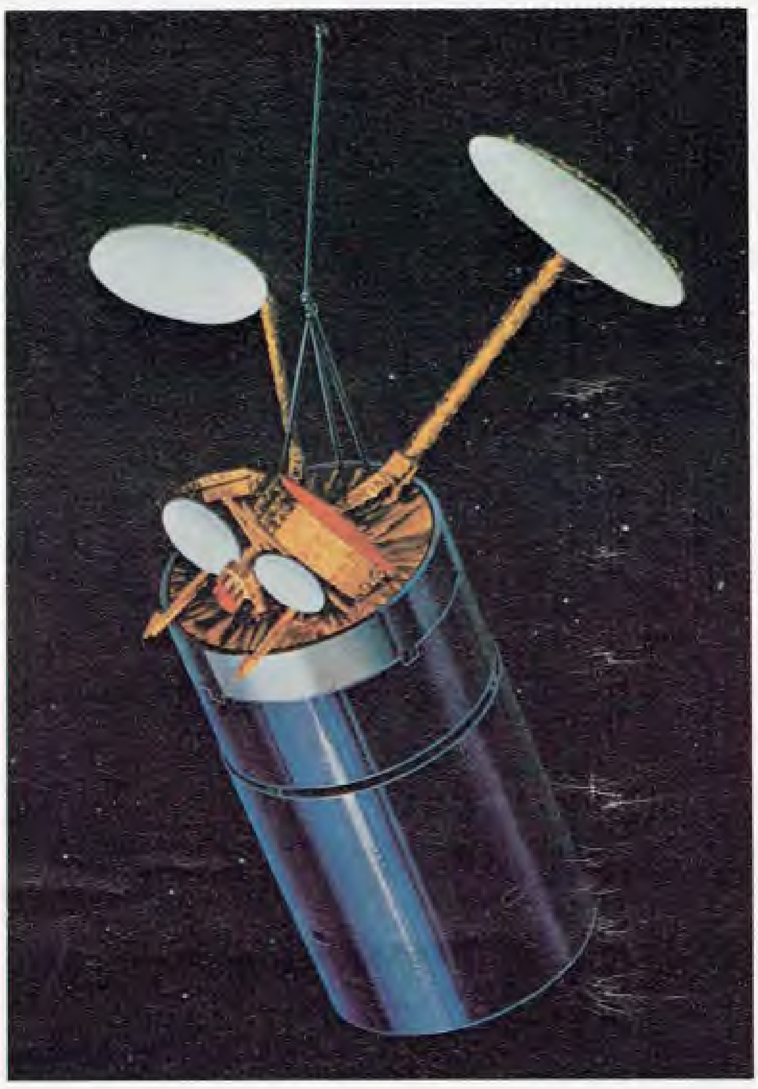
TELECOM Australia will soon make available 2400bits/sec asynchronous access to the Austpac network, recognising the market demand for high-speed connection to databases.

An official announcement may come with the impending introduction of Teletex (CCITT X.400 electronic messaging services), but sources said Telecom has been testing 2400bits/sec asynchronous access since June and "it works fine". It was now a question of readying access ports and dialup numbers in all States.

Doubling the available access speed would benefit users of databases and electronic mail services.

■ **High-speed modem market picks up speed — page 19**

Intelsat hits back at optics



TWENTY years after Early Bird, this Intelsat VI communications satellite packs a new kind of punch: it can carry up to 120,000 two-way telephone connections at the same time, plus at least three TV channels. New millisecond beam switching techniques let users set up point-to-multipoint networks via 48 connectable transponders. Our photo shows an artist's impression of the satellite, whose prototype was unveiled by Hughes Aircraft Company recently.
— Photo courtesy of OTC

By Luis Huesch

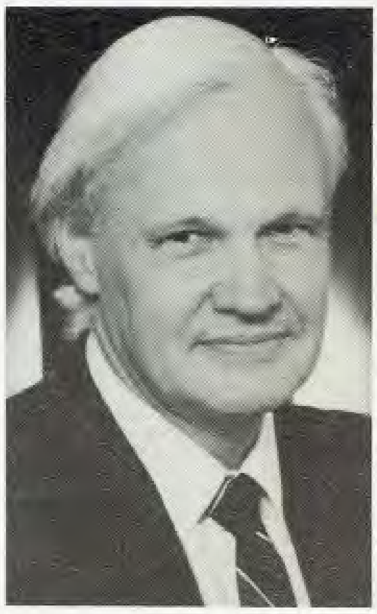
SYDNEY — Intelsat, faced with massive competition from optical fibre-based carriers, has unveiled a new 48-transponder satellite claimed to switch incoming information streams among six downlink beams in milliseconds.

The novel facility, called satellite-switched time-division multiple access (SS/TDMA), allows users in effect to create a point-to-multipoint network.

The 12-metre high satellite, to be launched in 1988 at the earliest, also boasts almost 10 times as much capacity (120,000 simultaneous phone calls) as its predecessors, increased power (up to 40W) 10 K-band transponders, 38 C-band transponders, wider and more flexible coverage — and twice the seven-year life of Intelsat V.

The spacecraft was designed to have two global beams, four zone beams that cover up to a continent; two hemispheric beams to service the eastern and western hemispheres, and two spot beams in the K-band that can be positioned at will.

The SS/TDMA, claimed to be a first on satellites, enables a transponder to send six downlink beams alternatively every two milliseconds. Typically, one of the 12 transponders that have this capacity receives signals from an earthstation and relays them over a global beam or a spot beam.



John Hampton . . . keeping launch options open.

The earthstation receiving via the global beam then picks out only the information addressed to that particular location. Spot beams are aimed at smaller user locations in a point-to-point service.

Beamed up

Earthstations making use of SS/TDMA will assemble and store digitised signals in the order they are to be relayed in, determined by the sequence of downlink connections. The signals are beamed up to the satellite in 120M-bit/sec bursts every two milliseconds.

In addition to this new facility, Intelsat VI — first shown as a prototype in July by Hughes Aircraft Co in El Segundo, California — will be able to carry on only eight of its 48 transponders all of the new Transat transatlantic optical fibre traffic if required, according to an Intelsat spokesman.

The transatlantic route is cheaper by satellite, too. The cost of a circuit/year on Intelsat was 1/3 that of optical fibre, said John Hampton, deputy director general for operations and development of the 110-member Intelsat organisation.

(Continued page 4)

CBC banking on Neax

By Noel Bennett

SYDNEY — The Commonwealth Banking Corp intends to instal about 25 NEC Neax 2400 Information Management Systems (PABXs) Australia-wide within the next two years.

The installation, at this stage, would make the bank NEC's largest Australian customer for networked Neaxs, according to a bank spokesman.

The bank was installing seven Neaxs, to be linked by 2M-bit links in a star configuration, in premises within Sydney's Central Business District (CBD) with 48K-bit/sec data lines linking the credit card authorisation centre at Parramatta with the Sydney computer operations centre.

The decentralised Neax systems will replace a centralised Hitachi-made PABX, installed in 1977. NEC won the tender on the basis of reliability, systems support, future development paths, networking capabilities, adherence to CCITT recommendations as well as price.

The ability to handle data and interface with the bank's IBM environment did not account "to a major degree" in the evaluation process, the spokesman said. However, the ability of NEC's Dterm handset to handle voice and data over existing cabling, so complying with relevant Telecom regulations, was a plus.

The main advantages seen as accruing from a decentralised approach was the flexibility and simplicity of accommodating the movement of bank officers from one building to another without using Telecom's outdoor exchange lines.

Altogether, there were some 3000 extensions within the bank's CBD premises and movement of staff was considerable. Neax operators will be centralised in the one building.

The Parramatta installation will

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Telemail to link users worldwide

By Luis Huesch

GTE is negotiating with Telecom and other PTTs to interconnect all 100,000-plus Telemail users worldwide.

Telecom has bought the Telemail electronic messaging system for its Telememo service, said to have 7500 users at present. Telecom also uses an inhouse e-mail system, Textfile, which has around 2500 users.

According to GTE Australia's general manager Jeff Collinson GTE is planning to link Telemail-based services in the US, Japan, Italy and other countries, including via CCITT X.400 standard interconnections. X.400 trials would be held in the US later this year. "The X.400 interconnection is being driven by the US," he said.

Collinson said Dialcom systems such as the Overseas Telecommunications Commission's Minerva e-mail service were still "a bit further away from X.400". Dialcom systems worldwide also have about 100,000 users. ITT recently sold the rights to Dialcom to British Telecom. GTE also operates the Telenet packet-switching network, hardware for which is sold in Australia through JN Almgren.

Asked about reports that a joint venture between GTE and Siemens to sell transmission equipment and central office switching systems in overseas markets would extend to Telenet, Collinson said: "Telenet is not part of the Siemens deal."

The two companies are to form an as yet unnamed new company by September 30, with Siemens reportedly taking up 80 per cent of the stock in the new venture. Sales of transmission equipment to telephone companies in Taiwan, Italy and Belgium will be the main business of the new company initially.

In July, GTE and US Telecom agreed to merge their long-distance networks and form US Sprint Communications.

Unions may merge

MELBOURNE — The first steps have been taken towards amalgamation of the Australian Telecommunications Employees' Association (Atea) and the Australian Telephone and Phonogram Officers' Association (Atpoa).

If the move is successful, the new union formed will have a membership of 36,000.

According to the Federal secretary of Atea, Mick Musumeci, the new union would have greater influence both in the trade union movement and with governments. The economies of scale would also enable the union to provide improved services to members.

Austpac billing set for export coup

SOUTH MELBOURNE — Standard Telephones and Cables Pty Ltd (STC) is offering software developed for Telecom's Austpac service to a national carrier in South-East Asia.

Software development work should also benefit from the telecommunications joint venture entered into by STC's parent, ITT Corp of the US, and Compagnie Generale d'Electricite (CGE), France.

STC is manufacturing the hardware for Austpac at its Alexandria plant. Software development is being carried out at the company's southern region headquarters in new premises in Melbourne officially opened recently by the Victorian Minister for Industry, Technology and Resources, Robert Fordham.

The building contains product showrooms and technical facilities, including a model X.25 packet switching network. A company official said the Austpac software could be segmented into three sections; packet switching nodes, network management centre, and accounting and statistics.

The accounting and statistics package had been running on a Honeywell DP-6 minicomputer. This package had been converted to run on Telecom's Fujitsu mainframe machines and had subsequently been offered to another carrier. STC was also investigating the development of value-added products for Austpac, such as a database to enhance the security of the network. Austpac is based on Transpac, the national X.25 network in France developed by Societie d'Etude de Systems d'Automation (Sesa).

The official said three STC employees were working with Sesa with the ultimate aim of the Melbourne centre becoming completely self-supporting.

The official said CGE was a shareholder in Sesa and through the tie-up between ITT and CGE, STC and Sesa were now part of the one family.

Although the official did not elaborate, this presumably would help the work being carried out by STC on Austpac and could present opportunities for work by STC to flow back to Sesa.

The ITT-CGE combination will reportedly be the world's second largest telecommunications company, after AT&T of the US.

'Breakthrough' in packet-switching

AT&T engineers are playing with a hot idea: wideband packet-switching technology that can send voice, data and images jointly over a single communications network.

According to the company's Australian offshoot, the new method — claimed to be the first packet technology fast enough to carry voice traffic practically — has been tested on a point-to-point 1.5M-bits/sec digital link.

Using AT&T's current generation of voice and data switches in combination with new voice/data integration prototypes and new parallel packet-switching matrices, voice/data/image packets were fed into a corporate network in San Francisco and sent to specific locations.

Speech coding was used to interleave other information during normal vocal sound pauses. The tests showed excellent voice quality was possible using only a fraction of the bits previously required.

The technology is tipped to yield a five-fold or better improvement in network capacity for voice alone. Together with lightwave and other research at AT&T Bell Laboratories, wideband packet technology is expected to provide the technical foundation of the carrier's Universal Information Services (UIS) concept for the late 1990s and beyond.

Lan marks AED's arrival on board

AED founders Wayne Wilson and Roger Jones with their Universe supermicro, a stepping-stone to greater heights.

By David Legard

SYDNEY — AED System Developments Pty Ltd has celebrated its arrival on the main board of the Sydney Stock Exchange with the release of its first communications product.

The company, which is best known for its Universe supermicrocomputer, has launched a local area network called Synx for IBM Personal Computers and compatible machines.

AED claims that any mix of PCs, terminals and AED microcomputers up to a total of 255 can run on a single Lynx network, providing all with access to CP/M, Concurrent CP/M and MS-Dos.

The first versions of Lynx will run on coaxial cable, but the company is already developing a fibre-optic system which it said will improve performance by a factor of five.

AED estimates the cost of installing Lynx to be $A1000 per node, which compares with an average hardware cost of $A5000 per terminal when shared resources such as printers and disk drives as well as software are considered.

AED is planning to raise $A2 million from its public listing, most of which will be used to fund additional research into its advanced architecture computer project.

Japanese carrier competition heating up

CWCI International News Service
By Takehisa Kondoh

TOKYO — The first of three new private Japanese common carriers, Japan Telecom Co, has begun cut-rate services to business in August, ushering in an era of free competition on the Japanese public communications market, long monopolised by Nippon Telegraph and Telephone Corp (NTT).

Two more carriers will offer competing services within the next few months.

Japan Telecom's optical fibre-based service was inaugurated with a group of about 10 customers in three major Japanese coastal cities. The carrier is now being used by 80 to 90 business organisations.

New services, which cost an average 24 per cent less than NTT's, are centred on high-speed digital transmission for data, facsimiles and video conferences. Among other offerings are analogue telephone/facsimile transmission, coded data transfer available in personal computer communications, and real-time picture transmissiion.

Public telephone exchange services are slated to begin in the last quarter of this year. All Japan Telecom services share NTT's existing facilities for local connections.

Japan Telecom, capitalised at $US58.8 million, was established last October to compete with NTT, which monopolised the Japanese domestic telecommunications market until the government liberalised the market in April 1985 by privatising NTT.

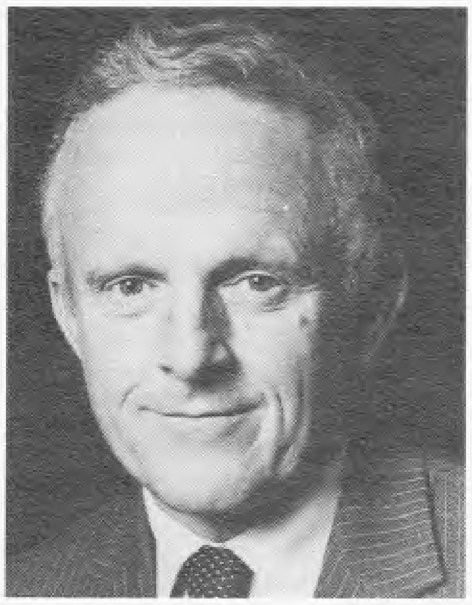
Led by Japan Telecom, two other carriers — Daini Denden, (DDI) and Teleway Japan Ltd — are slated to enter the $US32,700 million Japanese market in October and November, respectively. The two carriers' service offerings are almost the same as Japan Telecom's, but among the trio, only DDI will base its planned services on microwave transmission.

Japan Telecom president Kazumasa Mawatari said that he expects revenues of $US2.6 million during the first business year ending next March. In the fifth year, he said the company hopes to control about 10 per cent of the business communications market, now valued at $US1600 million.

DDI and Teleway Japan also are trying to grab a projected 10 per cent share away from NTT.

The competition will heat up further when a fourth carrier, Tokyo Communication Network Co, a Tokyo Electric Power Co affiliate, joins the race in November with services for the Tokyo metropolian area.

Metal trades get sharper edge



Senator Button . . . due to launch first live trial.

WOLLONGONG, NSW — The engineering industry database and online bureau services of the University of Wollongong's Illawarra Technology Centre underwent a first live trial in the presence of Industry and Technology minister John Button in mid-August.

Further live trials of the National Engineering Information Services Pty Ltd (Neis) videotex service were scheduled for the end of the month, according to its database administrator Geoff Howard.

Howard said Neis, formed in April with the help of BHP Steel International, the Metal Trades Industry Association, the University Computer Centre and Sperry Ltd, was still putting information into the database.

Details of some 350 contractors were already online, including between 50 and 60 from the Wollongong area. But only a minority of contractors had so far bought the hardware distributed by Neis, DTX Videotex terminals and Sperry personal computers.

Pending the official launch of what is intended to be a nationwide system, many intending users were communicating by electronic mail via Viatel, Howard said. A gateway to Viatel is part of the plan for the Neis database, which runs on an extensive Sperry 1100-based system. Four dedicated lines, each supporting up to 10 concurrent users, will give access to the system in its initial stages.

Videotex software has been "married" to the Mapper fourth-generation language to allow keyword enquiry and order tracking. Users can trigger transaction programs from within the videotex frames on their screens. An automated purchasing systems lets users place orders with participating suppliers of goods and services, for example, and the system provides pricing, back order control, discount structures and other ordering facilities.

Registration on Neis is expected to be $A100 for subcontractors and $A1000 for suppliers. User companies and government departments are to pay $A2000 registration. Annual subscriptions are $A360, with two advertising frames, for subcontractors, $A1500 with 25 advertising frames for suppliers, and $A2500 with 500 enquiry frames for principals and departments.

Database searches will cost $A1 a frame, plus 8¢/min connect time.

A tender database with tender management software and a products database with information on metals, metallurgical equivalents as well as standard section dimensions and properties are being added.

Auctioneers going, going online . . .

BONDI JUNCTION, NSW — Mayne Nickless Information Services, in collaboration with the Australian Meat and Livestock Corp, has developed a national online auction system to be launched later this year.

The system, called Calm (Computer-Aided Livestock Marketing), will be hosted by Mayne Nickless's battery of DEC machines with communication links via a combination of Mayne-Net and Austpac.

Mayne Nickless supports a prive videotex system for travel agents, Aftel. However, Calm is Ascii-based, prompted by the need to be both very fast and responsive in keeping with an auction system, a Mayne Nickless spokesman said.

Saving time

Much of the initial development work came from the Agricultural Business Research Institute at the University of New England in Armidale, now.

Advantages expected include saving of time of those participating in the auction, wider access to the auction, and improved condition of the stock on arrival at new destinations by minimising movements.

The spokesman said Mayne Nickless had another project under wraps.

Intelsat hits back at optics threat

(Continued from page 1)

Driving home the point about competitivity, Hampton said in Sydney recently: "We can use a quarter (of Intelsat VI's capacity) to restore something that costs twice as much."

Hampton, an Australian who went to work for Intelsat after a 23-year career with the Overseas Telecommunications Commission, was in Australia on holiday when he agreed to answer questions about satellite communications at an OTC press conference.

Asked about criticism of "empire-building" and massive capacity over-supply by Intelsat, Hampton agreed there was perhaps as much as 50 per cent surplus capacity now. This, he said, had been caused by:

- A better than anticipated launch success rate.
- A "surprising" downturn in demand (all forecasts were wrong, but the OTC's in Australia were the most accurate).
- Long lead times in the satellite business.
- New modulation techniques which boosted capacity.

But Hampton said the current scramble for optical fibre cables will result in even greater surplus capacity.

Hampton said Intelsat was not the only body to have over-estimated demand for satellite communications. Some domestic systems "have fallen far short of demand forecasts". One unnamed country with two satellites in orbit had only filled one — to a quarter of its capacity, he said.

The excess satellite capacity is not all wasted: Intelsat has a program called Vista, under which it allots transponder time to deserving scientific and educational organisations. The University of the South Pacific (USP), which had free time on other systems, was the most recent beneficiary of a program that has also beamed medical lectures into Canada.

The Vista scheme, put together seven years ago to service South Pacific islands, is not intended to encourage a lasting cargo cult, though. Nor is Supervista, its new offshoot, which offers "demand assignment" and three times the effectiveness.

In these "free" programs, which altogether take up only a fraction of the 16-satellite capacity, participants are expected eventually to sign up for commercial service.

Here, too, Intelsat has become a lot more flexible. Not only did it slash its rates "very substantially", it also has begun to actually sell transponders on the satellites, which have an estimated orbital life of seven years.

China was one of the first nations that bought transponders from Intelsat, said Hampton, adding that the organisation had made a solid $US40 million since it began transponder sales six months ago. (For those interested: a C-band transponder sells for about $US3 million, a K-band transponder for about $US5 million.)

The dominant service now is domestic use, with some nations being served by multiple transponders. Intelsat has looked hard at this trend, and has started offering a range of options, including outright purchase and tailored lease with varing levels of continuity of service protection.

Mobile services, with transportable antennas, are another area Intelsat is "looking at". It believed long-term developments would include "having lots of earth-stations", right down to having an earth-station "in a Bathurst business". Hampton neatly dodged a question about potential bypass of Telecom/OTC by referring the issue to the political arena.

Intelsat has seven satellites on order now: two of the V series, and five of the VI series. Hampton said the organisation hoped to get the first of the V series into orbit next year ("the French are talking about March") aboard an Ariane, whose third stage igniter is being redesigned after a series of failures.

The VI series would follow in late 1988 or early 1989, with shots spaced four to six months apart. Intelsat was "keeping its options open about other launch opportunities," said Hampton.

CBC banking on Neax

(Continued from page 1)

also host the first installation in Australia to NEC's Automatic Call Distributor (ACD) system, for queueing of incoming calls.

The operators here would be using NEC Dterm V handsets for voice. Data information would be obtained via 3270-type terminals through the data lines to the Sydney operations centre.

Supervisors would be equipped with NEC APC personal computers and be able to obtain traffic flow information from the management information system component of the ACD and so determine whether traffic should be reconfigured. These APCs are connected to Dterm V handsets with voice and data facilities operating simultaneously.

The spokesman said the bank had yet to make an extensive investigation of local area networks, and if it did so, it would consider solutions provided by NEC through its Neax such as voice mail, electronic text and facsimile.

The Dterm V handsets to be installed in the bank's CBD premises would provide casual access in the future to database information and a limited range of electronic mail facilities with dedicated access to the IBM network still being via 3270-type terminals connected to appropriate networks.

The Neax 2400 is able to handle both conventional telephone handsets as well as the Dterm units with the bank intending to place instructions on the new handsets and introduce video training sessions to allow officers to become easily familiar with facilities of the new exchanges.

Neax installations in other capital cities would follow a similar networking plan to that operating in Sydney with inter-capital linking. The spokesman said the choice of a PABX installation was just as important to a bank as choosing its mainframe supplier — it was necessary to get it right the first time so as to secure the most complete networking capabilities and facilities and so be set for the future.

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Courtnet to link State's legal eagles

SYDNEY — The NSW Attorney General's Department is embarking on an extensive network scheme to computerise most of the administrative functions of the State's courts.

At the same time, the department is involved in a major upgrading of its central PABX system. The network, Courtnet, is based on 14 Prime computers, a mixture of 2655 and 9955 models, 1000 Wyse "dumb" terminals connected through Primenet and NEC printers. Case multiplexers will handle the terminal traffic.

The equipment will be installed at the 186 courts throughout the State. The system will be distributed in the sense that remote sites will not be required to connect through to the main sites for decision-making or added processing power, a spokesman said.

However, courts will be communicating at low traffic levels and the department could use Austpac, although a full study of actual traffic levels has yet to be finalised, leaving the mode of communications still open.

The department has chosen a NEC Neax 2400 IMS exchange with a queueing system for its central Sydney offices which will be interconnected with a digital wideband line.

Users slam short-haul Megalink rate hikes

SYDNEY — Users of Telecom's 2M-bit/sec Megalink service have not only criticised the carrier for the magnitude of the recent tariff changes, but also for the sudden way they were implemented.

Other criticism maintains that the new tariffs discriminate against impending users.

Indicating the degree of the tariff changes, new users of a 1km link are facing a price rise of 87 per cent on rates pre-July 1 last, while rates from Sydney to Perth drop by 67 per cent.

In turn, Telecom says the new tariff structure should not distort Telecom's overall thrust in the "area of tariffs" for data communications users, saying that the new tariffs for Digital Data Services (DDS) will result in a reduction in data communications costs for virtually all classes of users.

While large organisations have been reluctant to "go public" with their concerns, Austcad Pty Ltd has been in the forefront in telling how the new charges will detrimentally impact its Cad/Cam bureau service.

Managing director Chris Harris said the company used 12 Megalink lines in the Sydney metropolitan area and one in Melbourne, with plans for expansion.

The result of the vastly increased tariffs for short hauls meant that one third of the company's revenues (previously one-sixth) would now go to Telecom. Supporting its new tariffs decision Telecom said it was not in a monopoly position in supplying high-speed services as customers could instal private systems such as microwave radio and optical fibre links, or use Aussat.

However, Harris said it was essential that planning should be for the long term. Organisations such as his could not jump into and out of technologies.

Line-of-sight

Accordingly, while Austcad was within reasonable line-of-sight with some of its customers, making private microwave links possible, the company had decided it would use Megalink only to avoid the problems of managing two different types of technologies.

Harris said he had expressed his views to the Prime Minister's office, to the Minister for Telecommunications, Michael Duffy, and to other ministers, as well as to Telecom. He had not received a reply from Duffy, which was "offputting".

While Aussat would not comment on Telecom's move, some users interpreted Telecom's action as hitting at Aussat's long-haul traffic. Other matters exercising users were that the abrupt change in tariffs, without any progressive phasing-in period, made planning much more difficult in an already turbulent economy.

While it was recognised that existing users got off comparatively lightly by Telecom's limiting the total increase in each of the next three years to 20 per cent, this was considered as discriminating against new users of the system.

Further, while Telecom partly justified the changes on the requirement of installing more plant and equipment to meet customer expectations, it was also argued by one user that the dramatic price changes could only mean that Telecom's initial planning was out of kilter.

In particular, Telecom says that the fall in prices for long hauls was made possible with the recent commissioning of a digital radio network on inter-capital routes.

The Australian Telecommunications Users Group has protested to Telecom. The executive director, Wally Rothwell, explores the impact of the charges in his column on page 10.

Shell's voice-mail profit in pipeline

By Noel Bennett

SYDNEY — Results obtained by the Shell company here from an AAP-Reuters-supplied Aspen voice/mail system had been very encouraging, according to Doug Jenkins, branch systems manager.

Results so far had indicated that the investment in the initial system would be recouped within two years in terms of operational efficiencies, Jenkins said.

The parent Shell company in London and The Hague had previously worked on voice/mail technology.

In Australia, investigation began into voice/mail under the stimulus of management which was "very forward-thinking and enthusiastic about trying out new technologies which could provide tangible advantages," Jenkins said.

When investigation began last year, by a group within the computing department responsible for examining new technologies, the only known suppliers were Wang and NEC.

The Wang demonstration had been most impressive but the price was of a magnitude which was not possible to justify in terms of potential benefits.

Subsequently, AAP-Reuters entered the market with its Aspen product which offered expanded features at a more competitive price, Jenkins said. This system was bought and installed during March-April last for evaluation purposes and it now supported close to 200 mailboxes.

The company could well extend the present system and/or instal others elsewhere in the Australian operations.

Jenkins listed applications and benefits as including:

■ Shell staff working in the Sydney metropolitan and country areas, from either their homes or a small office, were often on the road and Aspen overcame this two-way communications problem.

■ For people working within the Sydney offices, Aspen provided the correct sequences when calls were received as against receiving the usual message slips which might not contain the time of the call. Aspen also detailed more fully the nature of the call. As another by-product, PABX operators and those staff in the immediate area of an absent worker's telephone did not have to answer a call and write messages.

■ A receiver could also interpret the nature of the call, its urgency, for example, by hearing the sender's voice on Aspen. Further, the caller could be very frank as the system was very secure.

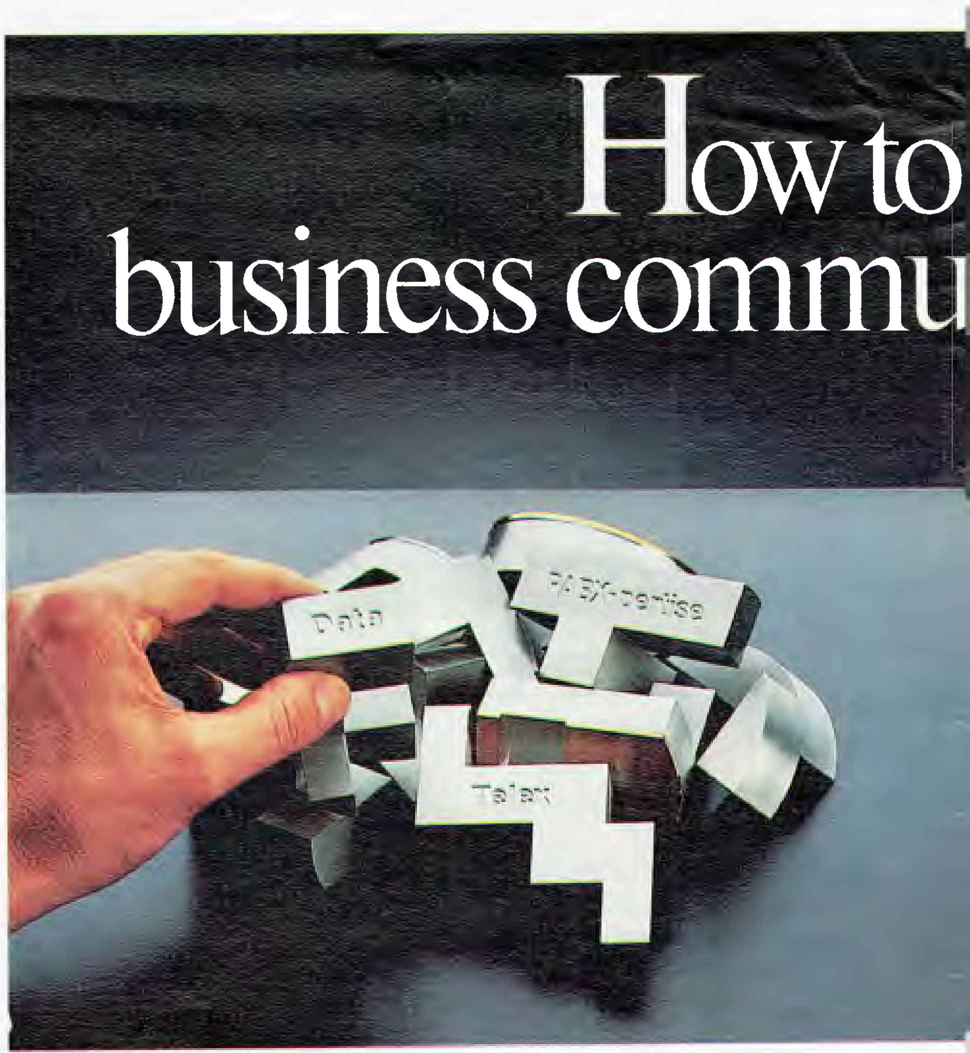
■ Messages could be sent or received at the convenience of the user. For example, managers overseas could send messages when convenient and without heeding time differences. Similarly, information sought could also be sent from Australia without accounting for different times of day or night.

■ The one message could be broadcast to all mailboxes, point-to-multipoint, avoiding the need to repeat the message a number of times.

The Shell organisation uses electronic mail based and it was likely that this system and voice mail would continue to exist side by side since the services were complementary, Jenkins said.

Further developments could include using Aspen as an intelligent answering machine, advising callers how to direct their calls to the relevant department or person.

Jenkins said that while a precise evaluation could not be made of the benefits of the system in dollar terms, the advantages recorded showed that the cost of the system was well justified.



How much do you know about transmitting data through the telephone network, at high speed and low cost? Do you still think of mobile phones as a luxury or an essential cost saving tool for businesses on the move? And what do you know of electronic messaging systems that keep you in touch with your correspondence, wherever there's a telephone line?

The jump from plug-in switchboards to earth circling satellites has understandably left many puzzling gaps in peoples' knowledge of business communications.

That's why calling in your Telecom business consultant is such a good idea. He'll show you how queries can be processed faster with the latest PABX's, Commander telephone systems, or even our advanced phones. How Telex and its close cousin Telememo provide instant written communications.

USP TAT 060/L

Users 'spurn latest gear'

By Noel Bennett

SYDNEY — Users are not interested in re-equipping their communications operations from scratch to take advantage of new technology, but prefer to enhance and maximise their present installations, according to IDC's Alastair James.

Customers were becoming more sophisticated and would be far less likely to buy vendor claims "hook, line and sinker," he said.

James, director of research with IDC Australia Pty Ltd, told a recent annual IDC overview of the computer/communications industry that despite the great number of new products, vendors themselves depended on the ability of users to plan for, implement and manage new solutions in order to sell new higher margin products.

This "rapid fire" introduction of new hardware, software and service options had confused and complicated the customer's planning and selection process, he said.

At the same time, however, these options offered the customer important opportunities for more cost-effective information systems and services. User organisations, feeling an urgency to take advantage of these new opportunities, were becoming more productive in efforts to sort through the maze of technology options and vendor claims.

James said IDC estimated communications to account for 18 per cent of the information processing industry and, with a predicted annual growth of around 24 per cent, expected this share to increase to 21 per cent by 1990. The data communications market has been particularly strong, with Telecom reporting an annual growth rate of around 25 per cent in connections.

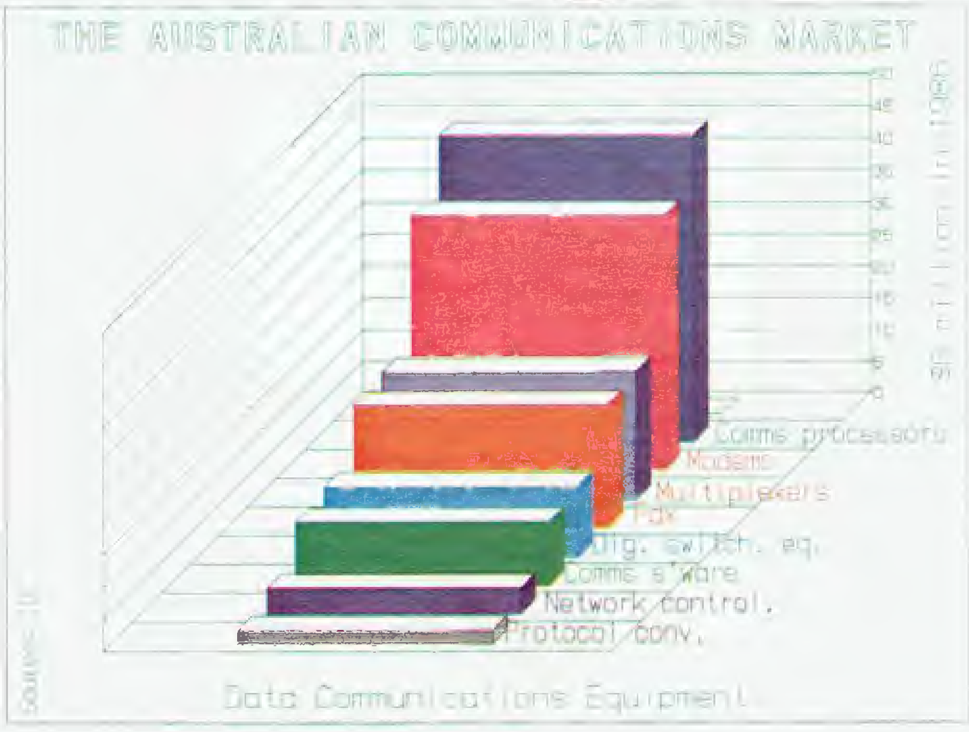
Datel connections had increased more than tenfold in the 10 years to 1986 to 102,000 and were forecast to reach 160,000 by 1991. However, DDS was likely to eclipse Datel by then with 194,000 connections.

Austpac was also showing very strong growth with an annual increase of more than 200 per cent.

This traffic surge had resulted in an accompanying strong growth in the data communications equipment market in which some Australian companies had identified opportunities.

High-growth areas

James said the future high growth markets of the telecommunications industry included: intelligent gateways and servers; communications software, including micro-mainframe links and "networked" applications software; local area networks; PABX add-on equipment such as data interfaces and ISDN terminal equipment; line consolidation devices such as port contention and matrix switching equipment; fibre optic links and digital transmission facilities and equipment.



James provided an overview of the following communications areas:

Network architecture standards: The continued development of standards for integrated, multivendor network architectures would be one of the most rapidly growing areas of technological innovation to watch this year.

IBM's SNA and the embryonic, but extremely important, International Standards Organisation's Open Systems Interconnection (OSI) model were the two most important standards for network integration.

IBM had become even more aggressive in its campaign to propagate SNA as the de facto standard for systems integration and the adoption of this architecture with IBM's Advanced Program-to-Program Communications technique, including LU 6.2, and DCA/DIA text standards, had been gaining momentum.

IBM compatibility had become an increasingly important criterion for competing vendor architectures.

On OSI, James said that while many systems manufacturers had endorsed it, few products were available which would permit users to implement such a network.

While not yet a fully implementable policy, the OSI model was important as it set standards for vendor product development. Vendors would move to embrace OSI to some extent for its marketing value alone, and would continue to provide gateways to SNA and OSI so as to enhance their own proprietary architectures yet protect them.

Market research in Australia had indicated that users were looking for standards to provide vendor independence and Telecom had firmly embraced international standards.

Local area networks: Lans offered particularly important promises for development of cost-effective ways to maximise the capabilities and usefulness inherent in a new generation of information processing and storage technologies.

However, many users had been hesitant in committing themselves to a Lan solution, inspired by ongoing arguments between equipment vendors over technological issues, confusion over standards, multivendor environments and systems incompatibilities, the lack of standard network software, the absence of an IBM Lan solution, and changing organisational management for communications and management information systems within many user organisations.

Many of these inhibitions were beginning to dissolve, and while debate continued as to the merits or otherwise of various Lan approaches, some consensus had been reached that many different types of this technology would exist in the marketplace and even within a single user's organisation.

Most of the dynamic debate remaining centred on issues of premises wiring, network operating systems software and network systems standards.

However, even with the emergence of IEEE 802 low-level standards — and standards were a sensitive issue for users — issues of multivendor compatibility had still not been resolved.

The challenge for both users and vendors was in physical and logical network integration.

Organisations still had a long way to go before they could link multiple systems environments efficiently and capably, but the availability of gateway, bridge and server technologies represented an important opportunity for users to plan for systems migration and resource consolidation.

Accordingly, important announcements would be made over the next year as users continued to demand solutions for integration and as vendors began to reap the rewards of this high demand, high margin, business area.

PABX-based voice/data integration: The inability of PABX manufacturers to deliver a truly integrated voice/data switch quickly had taken some of the bloom from the industry, James said. Users now realised that the ability to switch both voice and data simultaneously, at high speeds and in a cost-effective manner, might be further off than what they had expected.

Accordingly, users were beginning to accept the reality of managing two parallel networks — one for data and one for voice.

At present this approach had the advantage that while data PABXs or matrix switches could transmit data and manage the network for a cost of $A300 to $A600 a port, voice-oriented PABXs could not perform the data transmission function for less than $A1000 a line.

The advent of ISDN would boost the PABX market.

ISDN: One problem facing both users and carriers was that ISDN was still an incompletely defined moving target and customers who installed the "ISDN-compatible" equipment now available might find such equipment incompatible with future evolutions of ISDN.

Another issue to be resolved was the structure and level of user charging, and with Telecom provoking considerable user reaction to its recent increase in Megalink charges, it would want to do its sums carefully before introducing ISDN.

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USP TAT 060/R

Telecom Australia
Better for Business

Big changes in Telecom

By Noel Bennett

MELBOURNE — Deregulation is an ongoing process but should be done sensibly for the good of Australia as a whole, according to Mel Ward, new managing director of Telecom Australia.

However, as the increasingly vocal debate over deregulation and privatisation indicates, what is "sensible" and what is "good" is not as clear cut as perhaps they once were.

In the context of what is sensible and good, Ward cites the deregulation of the PABX market: "We have no God-given right to say in competitive areas that (they, the users) must take it from us and at a price higher than (from) any other source."

And explaining the strict requirements that Telecom has instituted for vendors in the PABX market, he said Telecom did not want to see Australia become a dumping ground where suppliers would do nothing to build up skills and employment opportunities and then leave the country as soon as short-term objectives had been met.

"In the terminal area, (Australia) is as deregulated as any other country in the world," he said.

Ward has the job of continuing the objective instigated by former manager director Bill Pollock of turning the Telecom battleship with its crew of 90,000 around to better respond to national objectives of making Australian industry, commerce and rural sectors more efficient and so better meet export and import replacement challenges.

User satisfaction

However, Ward does not agree with describing Telecom as a battleship, rather viewing the organisation as a fleet of destroyers meshing in closely with one another.

Within the next five to 10 years, Telecom would really begin to show the full benefits of what had been taking place in the past five years or so.

Big changes had already occurred, Ward said, citing:

- A greater portfolio of products and services.
- Improved relationships with large business customers to better understand and meet their needs.
- Establishment of a "more significant" sales force which also provided important feedback on the marketplace.
- Making Telecom more accessible to residential subscribers and providing services which were "obviously of great appeal".
- Introduction of the Vision 2000 program among Telecom staff to set standards of achievement in customer satisfaction and so ensure the future of Telecom.

In an era of quickening technological change marked by a rapidly proliferating number of options available for telecommunications users, it would be natural if the three carriers, Telecom, Aussat and OTC, were to collide over what organisation has the "natural right" to do what.

After all, these organisations want to "look good" to their ultimate shareholder, the Federal government.

One dispute over what constituted a "natural right" embroiled Telecom and OTC over electronic messaging systems: Telecom with its Telememo service and OTC with Minerva.

Ward said Telecom took the attitude that before the two services became too firmly established, it was necessary to determine whether the two organisations could work closely with one another and with the accompanying synergy provide customers with more efficient services.

On Aussat, Ward said it was not inappropriate that Aussat should have been established as a separate authority to run the national satellite services as it required specialist skills and it would have, as big users, the broadcasting industry which could use to advantage point-to-multipoint transmission.

Similarly Telecom recognised the capability of Aussat to provide alternative transmission paths for private networks.

Ward then raised a very sore point with Telecom, traffic switching.

"The government has put into the legislation that (Aussat) is not a common carrier for switched network traffic," he said.

"This is a very sensible provision" as it would be "quite inappropriate" for another government authority to put at risk developments over the past 80 years which had resulted in affordable communications for every one in the nation.

On the recently announced formal links with the Australian Information Industry Association (AIIA), Ward said such a link together with that with the Australian Electronic Industries Association should be an advantage to Australia.

As to user groups, in particular the Australian Telecommunications Users Group, from which Telecom withdrew after this interview was held, Ward said there were "tens" of user groups with defined interests whereas he believed that Atug was more an umbrella group tending to focus on a wide range of interests and "it was difficult" to see how an interest group of this nature could report on each member's interests.

However, Telecom could see a "meaningful interaction" occurring with interest groups by providing feedback from the customer base and providing an avenue for two-way flow of information.

Mel Ward . . . "deregulation should be done sensibily".

Canberra policies awaited

By Bob Mounic

THE Federal government has recently announced that it will prepare a statement of development policy on the information industry.

The statement will assess where the industry is today, where it is likely to be in the future and what environmental conditions the industry needs for it to achieve its growth and development aspirations. The statement will also examine ways and means of encouraging higher levels of use of information productivity tools in other industries.

Quite clearly the telecommunications industry and environment will form an integral part of the statement. While the telecommunications and computer industries have evolved in quite different environments — the former being highly regulated and the latter highly competitive — the two industries are now converging to form the information industry.

The Federal Department of Industry, Technology and Commerce has responsibility for preparing the Information Industry Statement and is expecting the statement to bring together the joint needs of the telecommunications and computer industries.

The government has also reviewed the specific needs of communications equipment producers and has outlined a strategy for that section of the industry. On the other hand, the information industry statement will be much broader and will encompass elements of the communications equipment industry strategy.

The policies and regulatory conditions governing use of basic telecommunications facilities offered by Telecom, Aussat and OTC are vitally important issues in this exercise. These conditions, which include purchasing policies and practices, standards, and policies governing attachment of equipment to the network and interconnection of private and public networks, all directly affect the nature, structure, performance and future development of the information industry.

Nowhere else does the convergence of telecommunications and computer technologies become more apparent than the value-added network services area. This convergence of technology has resulted in the development of new marketable "information products".

Substantial opportunity exists in Australia in providing value-added network services. These services cover such things as private packet-switching networks, messaging facilities and databases. They are

(Continued page 10)

Local Loop

Where it's at

☐ WE DO NOT wish to encourage a brain drain, but when a major Australian trading company lays off its poorly paid communications specialist as an unwarranted corporate luxury we cannot help but compare notes with the US.

There, according to a recent survey by our sister publication *Networld World*, telecommunications and networking professionals are sought after a lot more than even DP professionals, command $US30,000 to $US45,000 salaries with just a few years' experience and become partners in Big Eight accounting practices faster than some of their management colleagues.

Employers are prepared to offer realistic salaries to communications personnel to attract top-flight professionals, sometimes ranging up to $US100,000. "Many companies have a cadre of management people left over from the old communications days, and they just do not know what these new employees are worth," one recruiter commented.

Seeing the light

☐ TELECOM is a natural candidate for local-loop rumors: we had barely learnt that it was *not* true that Telecom's internal E-mail wasn't working because its unions didn't let it when an unimpeachable source volunteered the information that our august regulatory-cum-marketing agency had installed millions of dollars worth of the *wrong* optical fibre to link up its five Melbourne facilities. Ah, well, it has since seen the light . . .

Make a packet!

☐ PSST . . . wanna quick way to market with X.25 products? If you happen to have $US60,000 idling in an overseas account, or can scrape up the equivalent in Ozzie-dollars, here's how: Systems Strategies Incorporated has announced CX.25, a portable data communications package written in C and said to be a full implementation of the CCITT X.25 protocol. The package is aimed at the computer-to-packet-switching network interface designer, but as a side benefit permits high-speed data transfer by direct communication between DTEs. Oh yeah, talking about the price: there are also unspecified royalties to consider. Systems Strategies, 225 W. 34th St, New York, NY 10001.

Remote possibilities

☐ ULTRAFAST dial-up line modems are being touted as ideally suited for a variety of applications, from remote Cad/Cam to software distribution. After all, it takes under four minutes to download a 320K-byte floppy from Hong Kong to Sydney at less than $A7, as the local distributor of such a device points out. This opens up a new horizon of possibilities for software piracy and industrial espionage — think of the digitised plans of Pine Gap being zapped to Moscow. But let us think positive: how about packetised voice to ease long-distance romance? (AT&T's at it, we are told . . .)

Greeks bearing gifts?

☐ We recently had occasion to avail ourselves of the ubiquitous Austpac service, and could not fail to note how far Telecom goes out of its way to cater for our ethnic multiplicity. Thus a Greek named Asynchronou appears to be running a service under the Austpac umbrella, judging by the name on the user guide we received. It refers to "Asynchronou's character mode service (X.28)".

Astonishing though it may seem, 35% of Australia's biggest companies don't have one.

The phone on the left is an integral part of two highly sophisticated business communication tools.

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NEC

COMMUNICATIONS WORLD

EVERYBODY in the industry will by now be aware of the finding of a court of the land that Telecom has a case to answer because of the way in which it shouldered into the market for multi-featured telephone sets.

Justice Jackson of the Federal Court in his July order rejecting an injunction sought by Tytel Pty Ltd and two other Tyree companies — which essentially would have had the effect of preventing Telecom from underselling the Tytel phone — took the view that there was "a serious question to be tried".

He referred to documents tenders "which on one view of them suggest that officers of the respondent, knowing that competitive loading should have been, but had not been, applied were being devious in concealing that matter".

He also said that there appeared to be evidence which "if accepted" was open to the interpretation that Telecom "used its power in the market to set a low price for the Versatel for its introduction to the market . . . and did so for the purpose of substantially damaging the . . . applicants . . . or for the purpose of deterring them from engaging in competitive conduct in that market" in terms of section 46 of the Trade Practices Act.

Strong stuff — even if Justice Jackson stopped short of making findings of fact on these questions in order to avoid "a potential embarrassment to any judge coming later to try the matter".

There are other illuminating insights to be gleaned from the minutes of Justice Jackson's order, from the notification that Telecom is liable under the Trade Practices Act, to the recognition that it is capable of substantially controlling a market and to the observation that Telecom as early as 1981 quietly surrendered a tax privilege "amongst other reasons to avoid possible criticism that the exemption from taxation gave it an unfair competitive advantage".

But the real dynamite appears to lie in a couple of sentences that are so easy to overlook as to have escaped the attention of all public commentators to date. (I have been burning to light the fuse for nearly two months now.)

"I should observe in passing," said Justice Jackson on July 7, 1986, "that, as had the parties before me, I shall assume for present purposes that the Telecommunications Act does empower the respondent itself sell telephones to the public for attachment to the telecommunications service.

"I express no opinion, however, on the correctness of the assumption and on the consequences which should ultimately follow if it is not."

He also mentions, in parentheses, that Telecom, when it supplies the standard phones that come with its telephone service, retains ownership and only rents them out — and that it is those rentals *that "appear to be . . . referred to in . . . the Telecommunications Act".*

This, to my mind, is whistle-blowing of the first order — and if I am correct in my assessment, Justice Jackson has earned himself a place in the calendar of communications liberalisation in Australia.

Perhaps the judge's gentle reminder that even widely-held assumptions are open to questioning will prod Chris Tyree's industry colleagues — who privately profess to be "all rooting for Tytel" — to come out and put their money where their mouth is.

All of them, and all us users of communications products and services. can only gain from putting Telecom to the test.

Luis Huesch, Editor

Megalink rises still hurt

By Wally Rothwell

HEAVY increases in short-distance Megalink 2 tariffs have been in force for more than six weeks now, and most of the 55 users who on July 1 had a total of 240 services in operation are still finding it difficult to come to terms with the price hikes.

The article in July's issue of *Communications World* sparked a not unreasonable reply from Telecom, in which it is explained that an interim tariff was set because demand was small and some assumptions made about the cost of providing Megalink could not be realised. Those assumptions included an intention to use radio, but this was only possible in few situations because of line-of-sight problem and, in any case, radio performance was poorer than cable. Further, radio equipment prices have not fallen as expected.

While such explanations are understood and can happen to the best or organisations, it is difficult to comprehend that Telecom's undoubtedly high engineering expertise did not cater for these problems in its planning, especially for line-of-sight where the skyline of cities does not change overnight and is known well in advance. Why should the user pay for these miscalculations?

Atug has been able to track down users who operate some 73 per cent of Telecom's Megalink services and from this sampling, some interesting facts arise:

- ■ 96.75 per cent of the service is short-haul metropolitan where the most staggering increases occur — as high in one instance as 210 per cent. Thus it is not fair to imply that the short distance rates are offset by long-haul reductions.
- ■ 83.75 per cent use Megalink for voice communications (albeit digitised voice). Thus while it is true for Telecom to say that the cost of digital services, including DDS, to the community has been reduced overall, Megalink is *not* seen by most as a data service — and to lump it in with DDS is like adding apples and oranges.

Users had become used to and have accepted the Telecom pricing policy of increasing short- and reducing long-distance tariffs to bring service prices more into line with costs. But there is considerable surprise at the extent of the short-haul rises, with Telecom claiming that the initial prices, admittedly set three years ago, were prototype tariffs. We could not find any communications manager who was informed, even verbally, that the initial charges were "prototype".

It is not too late to rectify the situation. While recognising that a reduction in one area means higher charges in another, it should be possible to soften the blow.

Atug has made a submission to Telecom proposing that either:

- ■ the phased 20 per cent increase allowed over each of three years to existing users be reduced to say 15 per cent per year or perhaps 10, 15, 20 per cent over three years; or that
- ■ the 20 per cent be extended another year so that the increase can be taken up evenly over five years; and
- ■ that this offer be extended to *intending* users — many of whom have already made their plans — with a moratorium on taking it up of, say, 18 months or two years.

- *Wally Rothwell is executive director of Atug.*

Canberra policies awaited

(Continued from page 9)

offered by private companies to subscribers who pay a "usage" fee.

Typically these services are derived by enhancing the performance of basic telecommunication facilities offered by the common carriers. Overall, value-added network services offer users a more efficient means of assessing, recording and exchanging information at a much cheaper rate.

Not only has this rapidly growing sector offered expanded and new employment and income opportunities for Australians, but the services can easily be exported on international communications links and are readily sold in other industrialised countries. The value-added services industry represents a potentially big export income earner for Australia.

However, success of the value-added services sector is largely predicated on the regulatory policies and practices of the common carriers. Present conditions governing access to and use of basic telecommunications facilities have tended to mitigate against the rapid development of the value-added network services industry in Australia.

The Australian Information Industry Association (AIIA) believes that while the basic network lends itself to a public monopoly structure for the foreseeable future, the value-added network services areas must be open to competition, with market forces determining prices.

The association also believes that competition should prevail in the supply and maintenance of customer premises equipment. It is AIIA's view that no one should be excluded, including Telecom, from these markets, provided they compete on a fair and open basis with other suppliers and are subject to the same government charges, levies and laws as other competitors.

The immediate problem in this environment is that the common carrier is both a competitor and a regulator. There is growing feeling in the market that in some aspects of the CPE and VAS areas, the common carriers unfairly use their monopoly and regulatory position to ensure their continuing involvement in these commercial activities.

It is for this reason that the nexus of competitor and regulator is being broken in other countries. In the United Kingdom, for example, an independent regulator — Oftel — has been established to ensure that competition prevails in the telecommunications environment. The burning question in Australia is: do we need an Oftel? It certainly is an issue for the Information Industry Statement to address.

- *Bob Mounic is executive director of the AIIA.*

COMMUNICATIONS WORLD

Editor: Luis Huesch
Associate Editor Noel Bennett
Contributing Editor: Tom Amos
Production Editor: David Blackburn

ADVERTISING:
National Sales Manager: Susan Taylor
New South Wales: Gayle McElroy, Steven Hedge
Victoria and South Australia: Cherie Bridges (03) 690 2933
Queensland: Jane Fewings (07) 378 4522
Western Australia: Winkie Corfield (09) 384 5856
Co-ordinator: Faye Fischer

CIRCULATION:
Manager: Shirley Ingram
Supervisor: Dorothy Adams

PRODUCTION:
Manager: Max Jaeger
Supervisor: Franz-Josef Heber
Typesetting: Iris Clench, Glenda Jaeger, Terry Lee
Pasteup: Matthew Roots, Susan Arbouw Graham Twilley
Camera: Bill Crump

Communications World is published every second month by Computerworld Pty Ltd

Managing Director: Alan Power

Directors: Patrick J McGovern
W Walter Boyd

General Manager Barbara Howell

Computerworld Pty Ltd also publishes: *Computerworld Australia; Australian PC World; Australian Macworld; Greenbook of Software and Related Services.*

Computerworld Expo organises integrated conferences and exhibitions.

SYDNEY HEADQUARTERS:
Computerworld Pty Ltd, 37-43 Alexander Street, Crows Nest, NSW 2065, Australia. Tel: (02) 439 5133. Tlx: COMWOR AA74752. Fax: (02) 439 5512.

MELBOURNE OFFICE:
Computerworld Pty Limited, 74-76 Eastern Road, South Melbourne, Vic 3205. Tel: (03) 690 2933. Tlx: COMWOR AA33926. Fax: (03) 690 4362.

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Communications World is distributed to Computerworld Australia subscribers and to qualified charter subscribers in the communications industry.

Printed by Offset Alpine Printing Pty Ltd,
Silverwater, NSW.

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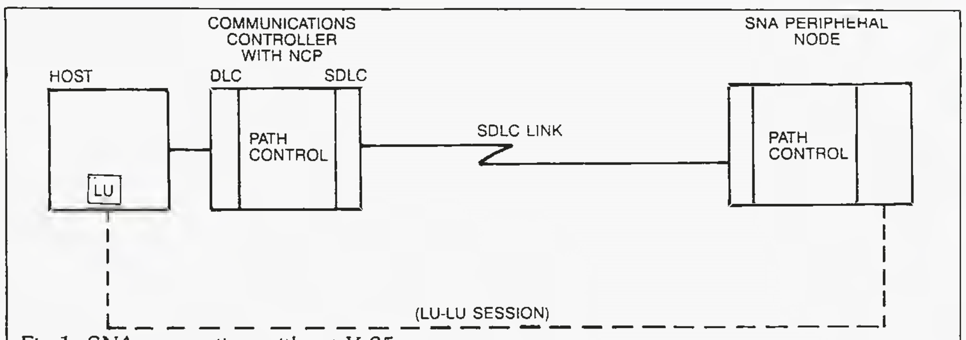

Fig 1: SNA connection without X.25.

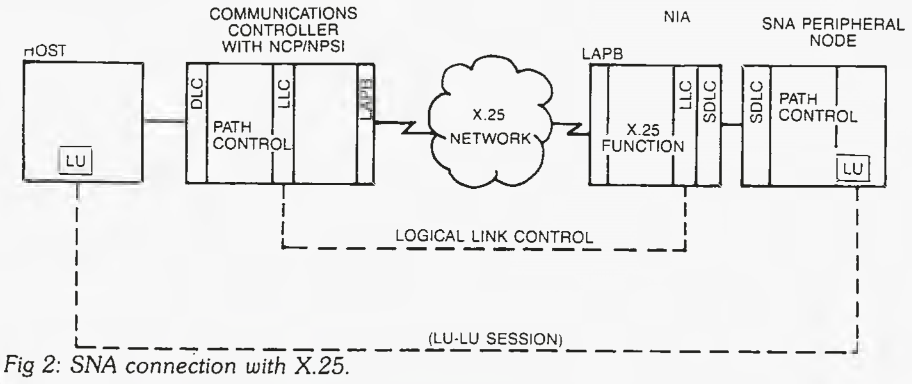

Fig 2: SNA connection with X.25.

Save a packet switching into

By Kevin Bloch

IBM'S dominance in data processing needs no restatement. The announcement of systems networking architecture (SNA) in the 1970s kept customers close to the fold, restricting access to non-IBM systems, but at the same time providing them with the comfort of committed support for existing equipment.

IBM's commitment to its customers by the early introduction of a networking architecture helped in rapidly establishing a large installed base of users. However, while competitors were free to introduce new technology and standardised architectures, this large established base of IBM customers restricted in some cases the extent to which IBM could introduce new technology into SNA.

During the 1970s the DP industry sensed an increasing urgency for standardisation. Information was becoming a strategic company resource and the communication of this information was restricted by incompatible computer systems. Standards organisations such as CCITT, ISO, ECMA and others, through the recommendations and standards which they provided, were seen as an essential means by which the obstacles to communication could be overcome.

During this period, CCITT X.25 developed into an established networking protocol, which is now supported by most of the major computer vendors — the seeds of the open systems interconnection (OSI) reference model were sown.

IBM responded with the development of a software interface package designed to run in a 37X5 frontend processor which could interface directly into an X.25 network. This product, NCP packet switching interface (NPSI), has subsequently gone through several revisions, launching it from a "whispered about" product to its current status which may be regarded as a key marketing tool in the OSI/X.25 battle.

The licensed IBM NPSI program is designed for operation with networks conforming to recommendation X.25 (Geneva 1980) of the CCITT. The program runs on an IBM 37X5 frontend processor under the control of ACF/NCP.

Fig 1 shows a standard SNA configuration. Fig 2 shows this same configuration using an X.25 network as the transmission medium.

The SNA/X.25 interface device shown in Fig 1 is provided by IBM in the form of a network interface adapter (NIA), designed to facilitate the transport of an SDLC link connection within an X.25 connection. The protocol used to control this process is called logical link control (LLC).

The LLC protocol reserves and uses the first two bytes of the data in the data packet. These bytes are called the physical services header (PSH). The PSH is interpreted by the LLC in NPSI and the NIA, thus the host application and secondary LU are unaware that an X.25 network has replaced a leased line. Indeed all layers above data link control (DLC) in SNA are unaware of this transposition.

While most X.25 vendors closely monitored the standards committees, some also sought ways of supporting protocols other than X.25 on X.25 networks.

In the late 1970s three major packet switching vendors — Telenet, Tymnet and Datapac — jointly established the IBM 3270/BSC/DSP protocol across a packet network. This standard is now used extensively both by the three originators and by many other Pad (packet assembler/dissembler) manufacturers.

Fig 3 illustrates a typical implementation of the 3270/BSC/DSP protocol across a packet network: the Pad at the terminal emulates the frontend processor while the Pad at the frontend processor emulates the cluster controller.

This method saves expensive bandwidth on the X.25 network. The overhead of polling is eliminated from the network itself, since only data and specific control messages are passed across the network.

In Australia SDLC is far more common than 3270/BSC. Support for this protocol across an X.25 network has not been

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by using X.25 the SNA world

standardised. Surprisingly, there are only a few X.25 equipment manufacturers who can support this protocol.

GTE-Telenet offers this support on both the public US network and on private Telenet networks in the form of a Pad called the Hpad or HDLC Pad. The GTE-Telenet Hpad is a device which can be used in place of an NIA. It does not use LLC and the inherent overhead of the PSH. Instead, it uses a procedure known as qualified logical link control (QLLC).

In this case standard X.25 data packets, with the Q-Bit set to 1, are used to pass SNA information between NPSI using QLLC and the remote X.25 interface. Configurations using Telenet products are shown in Figs 4 and 5.

Fig 4 shows the use of the Telenet HPad in conjunction with NPSI via QLLC. Fig 5 shows the use of the Telenet HPad without the need for NPSI. In this case, the IBM configuration can be "standard" — free of additional and separately priced NCP software.

There can be significant advantages in not implementing NPSI in the host and using HPad's instead:

- NPSI is a separately licensed program product with associated costs.
- It eliminates the need for an NIA which is more costly and can only handle one SNA peripheral node.
- NPSI requires extra storage. In many cases an IBM customer may be required to replace a 3705 with a 3725 to ensure sufficient storage. This can be a costly upgrade.
- The addition of NPSI to a site may add to the problems of the NCP system programmer. The system generation will require the learning of a new set of macros and their attendant parameters. As a new NCP generation can take many hours of processing and many errors do not become evident until the new configuration is loaded, some users are reluctant to change configurations.

The previous examples are related to a single SNA host environment. As SNA has evolved, the larger users, who have multiple processors, have required that SNA peripheral devices be able to connect to a processor of their choice. This is especially true for users of 3270 devices and, to a lesser extent, those requiring RJE facilities.

The methods employed by SNA to facilitate these requirements are cumbersome when compared to the inherent switching advantages of X.25. IBM uses a hierarchical architecture from both a hardware and software point of view. The higher the position of a device in the hierarchy, the more intelligence it has.

The early implementations of SNA required a host application to perform all switching of resources in the network, thus placing additional load on the CPU — and the programmers whose task it was to make it work.

Later releases of SNA have seen two fundamental enhancements. These are multi-system networking function (MSNF) and SNA network interconnect (SNI). SNI actually uses methods employed by MSNF, but increases addressing capability while relieving the user from maintaining unique naming throughout the network.

The implementation of MSNF or SNI can be both expensive and complex. It is fairly obvious that switching at a lower level — the network layer of the OSI model — prior to accessing a host, is more efficient than having the host processor involved.

Although IBM is tackling the problem by introducing physical unit 2.1 and a number of new logical units (for example LU6.2) the effort can largely be viewed as a "retroactive patch". The main problem is that SNA does not lend itself, at this stage, to switching in the network.

The reason is the hierarchy of the functional components of SNA. It is in this area that products such as those used on Telenet X.25 networks, can help to great effect.

Fig 6, 7 show the scenario in which an X.25 backbone network has been installed between the host-node and the SNA peri-

(Continued page 14)

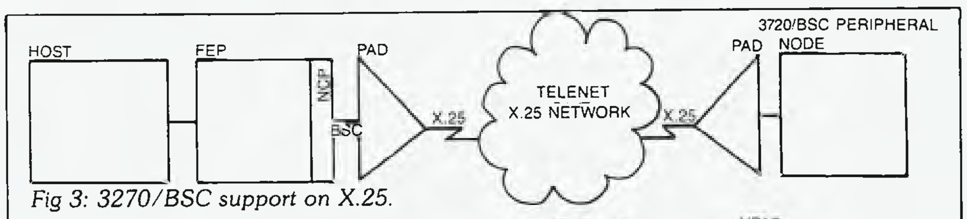

Fig 3: 3270/BSC support on X.25.

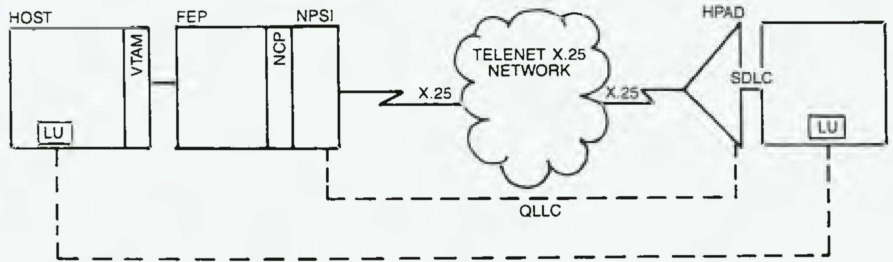

Fig 4: SDLC support on X.25, using the Telenet Hpad and NPSI.

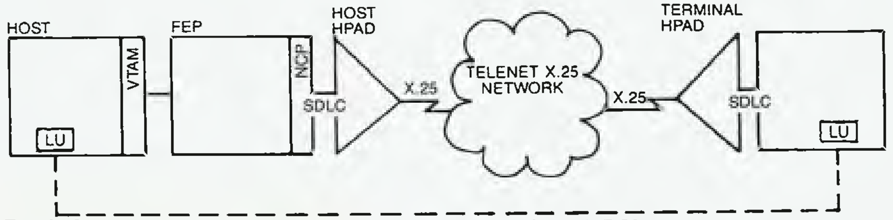

Fig 5: SDLC support X.25, using Telenet Hpads without NPSI.

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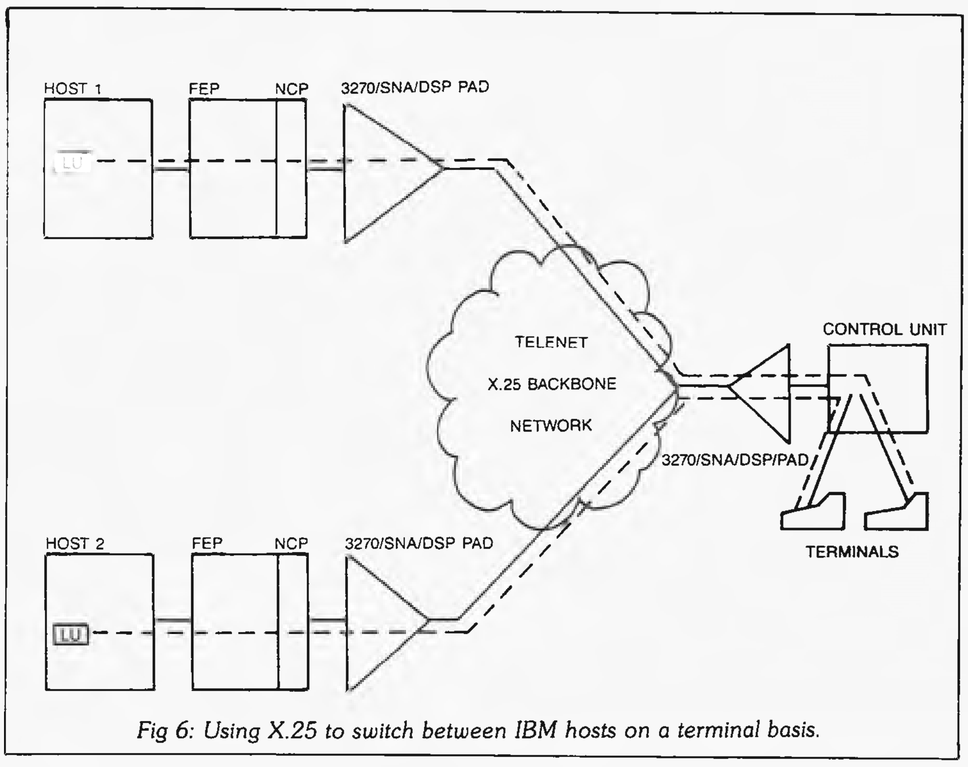


Fig 6: Using X.25 to switch between IBM hosts on a terminal basis.

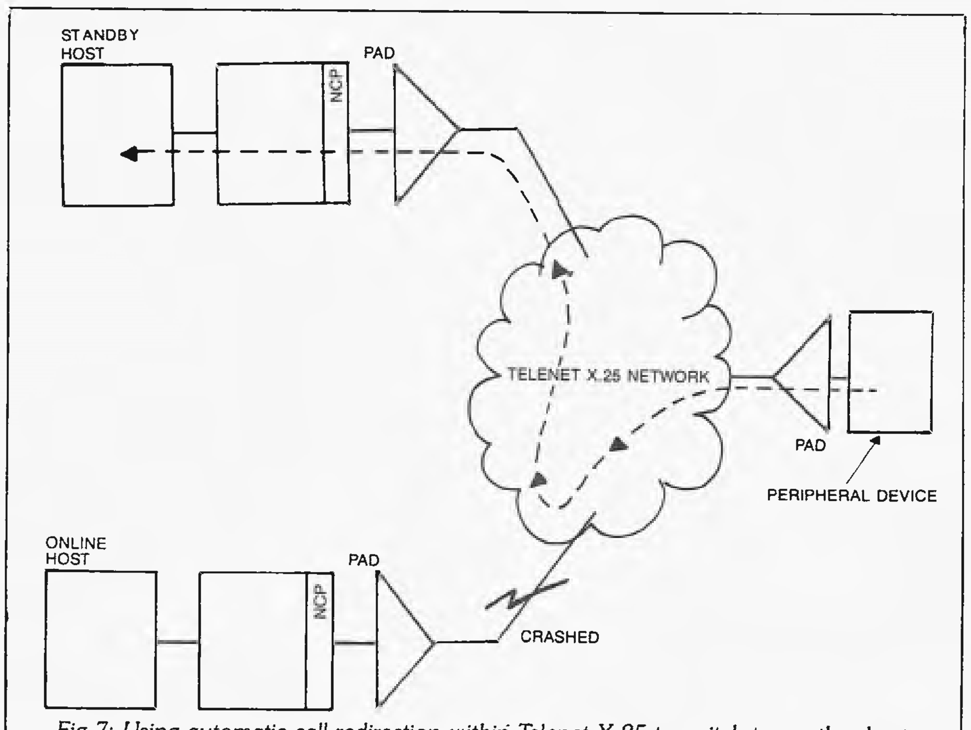


Fig 7: Using automatic call redirection within Telenet X.25 to switch to another host.

Saving a packet by switching

(Continued from page 13)

pheral node. Since the peripheral nodes requiring switching are IBM 3270 devices, a Telenet 3270/SNA/DSP Pad can be used.

Benefits

This device allows individual terminals on the same control unit to switch to different hosts. It requires a Pad at both terminal and host sites and does not use NPSI. Each host/NCP is configured with "phantom" physical and logical units which match the characteristics of the actual devices which may connect to it via the network.

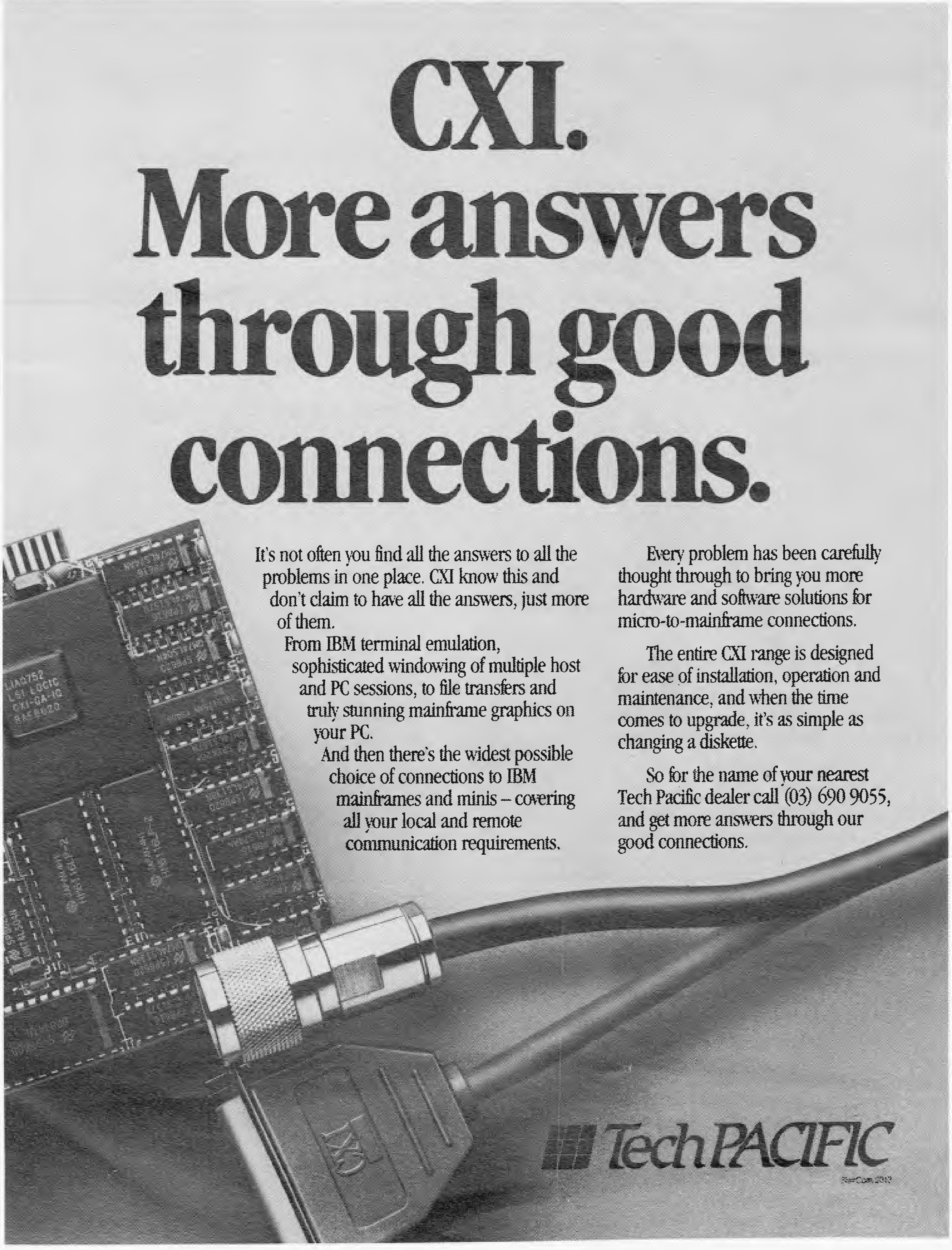
Now the network can achieve the switching and the host believes that a device it "owns" has become active. In some cases, by the above method, it is possible to eliminate MSNF from the network entirely.

In addition to the methods of switching described above (3270/BSC/DSP and 3270/SNA/DSP), some X.25 networks implement a technique known as automatic call redirection (Fig 7). Using this technique alternative, hosts can be configured in the network to be automatically tried in the event that a host is down or does not have any available resources.

The benefits of providing switching within the X.25 network are:

- The need for MSNF, which is an expensive program product, can in some cases be eliminated.
- The system generation task is simplified thus relieving the programmer from a major task. (The administration of an MSNF network is also a major task that can be simplified.)
- The host is relieved from processing session requests not destined for it.
- Improved response time. Although it can be argued that X.25 produces extra overhead, this is not significant when compared with the existing SNA overhead. As the network is designed to carry the traffic it will act in a consistent manner, whereas response time in MSNF or SNI will depend greatly on what host/NAP resources are in use.
- There is a reduction in wasted bandwidth as a result of minimisation of the size of the transmission header.

- *Kevin Bloch, B Sc, B E (Hons) is systems engineering manager for J N Almgren P/L, which represents Telenet in Australia.*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DATACRAFT is a leading force in data communications in Australia and South East Asia, with subsidiaries in Hong Kong, Singapore, Malaysia and New Zealand. It has Australian-based manufacturing and design facilities and a stronghold on the export market with export sales in excess of $A1 million in the last financial year.

Currently, Datacraft exports a variety of Australian-made products to New Zealand, Hong Kong, Singapore, Malaysia, Japan, UK, US, Sweden, Mexico and India.

The company designs and manufactures many products in Australia, and imports a wide range of quality communications products from overseas which it markets to computer users in government, industry and commerce.

Datacraft combines its access to advanced overseas and Australian technology with its own design and manufacturing resources and uses its experience to provide consultancy and maintenance services.

The current Australian business environment is looked on by Datacraft management as having both risks and opportunities.

The low value of the Australian dollar is depressing the market, causing an increase in price competition and greater difficulty in covering exchange costs.

However, this can be balanced against the company's recently expanded manufacturing facility plus its greater range of Australian-designed and made product, which will not only help to increase its competitiveness in the market but means it is well placed to pursue and capitalise on export opportunities and to address contract manufacture, including offsets.

The company receives substantial grants from the Industrial Research and Developments Grants Board and spends in excess of $A1 million annually on R&D projects.

In May this year, Datacraft opened a world-class manufacturing facility at North Croydon, Victoria, at a cost of $A2.2 million and moved its customer service headquarters to new and larger premises at Blackburn.

In the immediate future, Datacraft intends to concentrate on large network business, finance industry datacom/EFT-POS needs, as well as its traditional data communications business.

The executive chairman, George Kepper, founded the company in 1974 when he saw the need for specialisation at a time when communications were simple by today's standards. Since, Datacraft has grown into a medium-sized Australian company supplying the needs of a sophisticated clientele.

The continuing growth and rapid technological change in the data communications industry promoted the company to offer shares to the general public in early 1985.

According to George Kepper, many companies have become critically dependent on the data communications industry for the efficiency of their information processing systems in recent times, and it is Datacraft's positive response to their needs which has helped to put the company at the forefront of the data communications industry.

Kepper sees Datacraft as an approachable company offering network solutions to a broad customer base.

"We would like people to feel they can come to use for advice on how to solve their communications problems," he said.

"We do not want people to think Datacraft is too big, too technical or too impersonal," he said.

Kepper believes it is this approach which has helped the company retain the support and respect of its customers so far, and it is therefore Datacraft's ability to provide sensible and cost effective solutions which has helped retain the loyalty and respect of key customers over the years.

"It is the way Datacraft has combined a strong marketing and sales team with exceptional technical back-up, plus an Australian R&D and manufacturing ability which has been largely responsible for placing Datacraft at the forefront of the data communications industry," he said.

"The marketing and sales team is a highly qualified and motivated group of dedicated individuals who believe in Datacraft and are committed to the concept of creating solutions matched to individual needs," he said.

The company is divided into separate profit centres with each of the overseas subsidiaries having its own managing director.

Engineering capability

To constantly meet the needs of a rapidly changing marketplace, Datacraft has put considerable effort into establishing a world-class engineering group.

Based on its initial success in creating the 5096 Universal Data Modem, Engineering has developed into a technically innovative group of more than 30 highly trained engineers and technicians.

The broad tasks of the engineering group are the technical evaluation, design, development and certification of all new products within the Datacraft group of companies.

"The engineering group is the driving force behind Datacraft's effort to increase the ratio of locally manufactured products in its range and significantly boosts the company's export effort," said technical director Russell Crothers.

It is structured around two independent activities, R&D and systems engineering.

The research and development operation is primarily responsible for local product design and development of the manufacturing stage.

This group, which is staffed by 15 highly qualified and experienced design and development engineers, technicians and draftspersons, provides the company with a nucleus of experts in electronic and mechanical design, software development, engineering documentation, pre-production manufacturing assembly, evaluation and test specification generation.

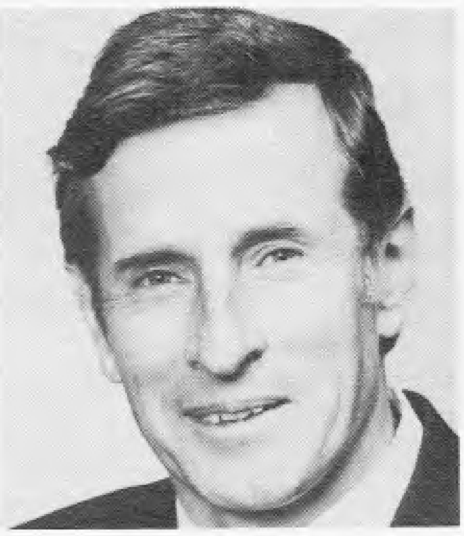
The R&D Group is further supported by Systems Engineering which concentrates on evaluation of imported products, their conformance to Australian Standards, their certification and positioning within the framework of the full product range, as well as pre-sale technical support and product training.

In addition, Datacraft Systems Engineering plays a significant role in external project management.

"Increasingly, the emphasis is on the development of software to provide both operating system and application level software support for Datacraft's extensive range of large-scale networking systems," said Crothers.

"Once a development task has achieved project status, a project leader and support team are appointed to create a project proposal for management approval.

"This allows us to keep a constant check on project status and progress, and helps us to establish priorities while keeping product development within tight parameters," claimed Crothers.



George Kepper . . . *saw need for specialisation.*

To achieve its product development goals, Datacraft engineering has built a special combination of technical skills and specialised equipment capable of implementing the best proven technologies into its product designs.

One exciting project in the pipeline is the application of microprocessors, micro controllers and VLSI devices to improve product flexibility and power while reducing size, cost and component failure.

There are also considerable advances in Digital Signal Processing (DSP), and Integrated Services Digital Networking (ISDN)," said Crothers.

"These devices are applicable to Datacraft's product needs and are being evaluated for suitability in the next generation packet- and circuit-switching systems and products," he said.

"We are paying a lot of attention to emerging network management needs and to the evolution of bypass or alternative transmission methods within the data communications field," said Crothers.

Product construction and packaging, together with high efficiency power supply systems, are also being revolutionised by new and often smaller devices and practices," said Crothers.

Datacraft recently invested $A2.2 million in a world-class manufacturing facility at North Croydon, Victoria, to support its commitment to produce Australian-made product for both the local and overseas markets.

Superspeed V.32 modem

A NEW high-speed supersonic modem from Concord Data Systems is about to be launched in Australia by Datacraft.

According to product manager Vince Bugno, it is Datacraft's awareness of the ever increasing demand for high-speed, accurate communication links capable of overcoming all obstacles in a single bound which prompted the company to search out and find the best and most cost effective V.32 modem available which conformed with all current CCITT recommendations.

"The new CCITT V.32 recommendations call for two-wire, full duplex, dial/lease line modems which operate at 9600 and 4800-bits/sec. Such modems are the logical follow-on from widely used 224/V.22 bis 2400-bits/sec products. They must employ echo cancelling and trellis coding technologies to yield the 4800 and 9600-bits/sec operation speeds," said Bugno.

"Trellis coding is crucial to 9600-bits/sec dial transmission," he said.

"It dramatically reduces errors caused by line disturbances, and it increases throughput even over marginal telephone lines."

The Datacraft/CDS V.32 Trellis is a full V.32 compatible, 9600/4800-bits/sec, full duplex dial or two wire/four wire leased-line modem ideal for synchronous applications.

For dial line applications, at lower speeds, the V.32 Trellis will cut transmission costs immediately, claimed Bugno.

It is perfect for 9600-bits/sec full duplex point-to-point dial applications.

In any high speed application, it is the best possible dial alternative to the ongoing expense of a leased line and inevitable installation delays. However, if you are already using leased lines, the Trellis V.32 will improve transmission accuracy and provide a reliable, single-call full-duplex, dial back-up from the same modem.

Characteristics

The CCITT recommendation on V.32 calls for "a family of full duplex modems, operating at the data signalling rate of up to 9600-bits/sec on the general switched telephone network, and on leased telephone circuits."

The principal characteristics of these modems, as defined in the draft recommendation from the CCITT committee meeting are as follows:

a) Full duplex mode of operation on the general switched telephone network and two wire point to point leased circuits.

b) Channel separation by echo cancellation techniques.

c) Quadrature Amplitude Modulation (QAM) for each channel with synchronous line transmission at 2400 baud.

d) Any combination of the following data signalling rates may be implemented in the modem: 9800 bits/sec synchronous; 4800 bits/sec synchronous; 2400 bits/sec synchronous (further study still required).

e) At 9600 bits/sec two alternative modulation schemes, one using 16 carrier states and one using trellis coding with 32 carrier states are provided for in this recommendation.

f) Exchange of rate sequences during start-up to establish the data rate, coding and any other special facilities.

The Concord Data Systems Trellis modem fully complies with these recommendations.

Potential applications for the V.32 modems are:

(1) Dial backup at 9600/4800-bits/sec for failed leased-lines

(2) Use W/IBM SDLC Synchronous terminals (3270 and 2780)

(3) Accessing public packet switching networks

(4) Enhanced graphics transmissions

(5) Upgrading point-of-sale (2400-bits/sec/201C) and RJE (4800-bits/sec/208E) terminals

(6) Accessing X.25 pads and TDM/STAT Mux equipment

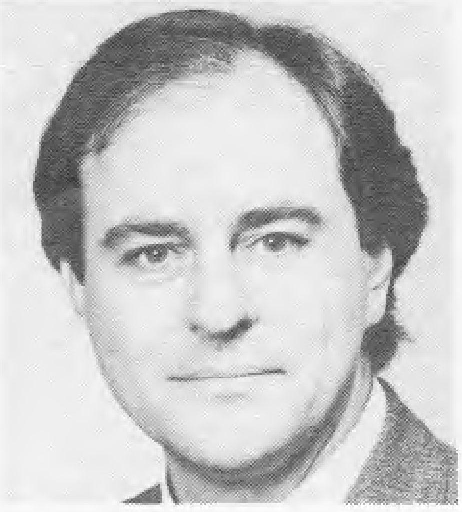
(7) Provide increased access to information data banks

(8) Supporting expanded corporate PC usage

(9) With voice digitisers.

‘New’ Datacraft is quicker on its feet

By Noel Bennett



Peter Pryor . . . “high-tech stocks face psychological problems”.

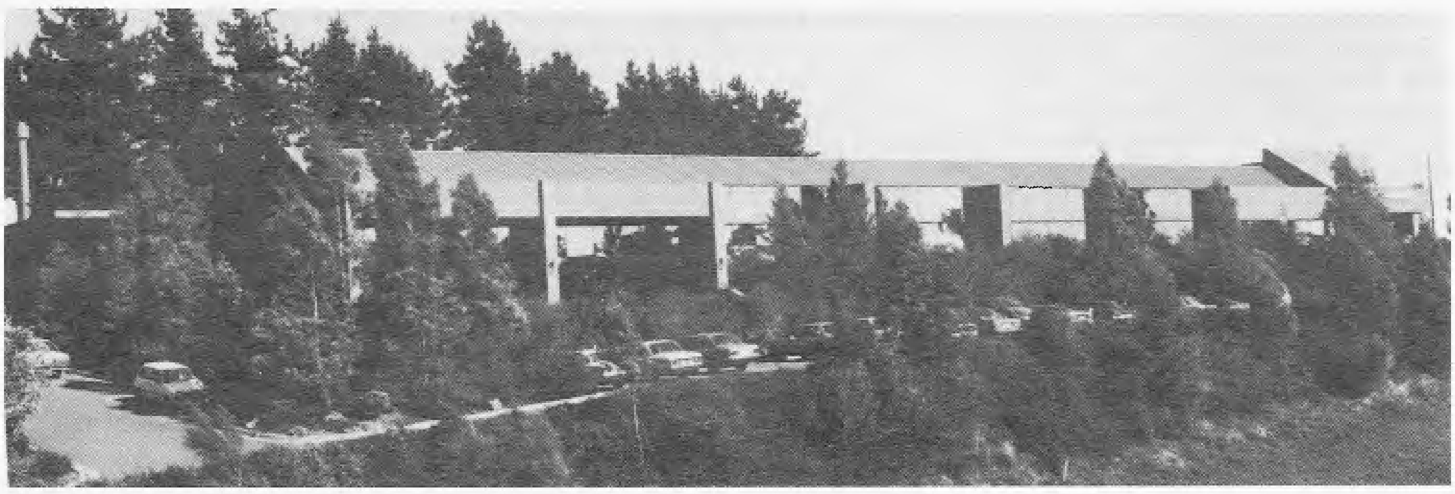
“CROYDON, wasn’t it?” the cab driver asked, breaking a long, long silence. “North Croydon,” the passenger replied and asked tentatively, apologetically: “We’re still on the highway?” not wishing to upset the driver with any doubts as to his driving and geography, but still wanting assurance. It was a long way.

“Yeah. We’re still on the highway, but if we don’t hit it soon, I’ll pull into a service station and ask,” the driver replied, looking again at the road map balanced on the central console.

Datacraft was found eventually, by carefully peering through enveloping trees on the other side of the Maroondah Highway. A reckoned 30km to 35km from Central Melbourne, the administration building is on a hill, obscured by trees, but the newer close-by factory building presents a more open face to the world, though still not readily identified.

But Datacraft Ltd, the parent of Datacraft (Aust) Pty Ltd, has necessarily become a more open company since its public listing in 1985. And the stock market has been severe in its judgment, as it has been with other hi-tech stocks, pushing the 20c par shares down from a year’s high of 90c to a recent year’s low of 30c.

The managing director of Datacraft (Aust) Pty Ltd, Peter Pryor, noted that he believed the market was still strong, but that hi-tech stocks worldwide faced “psychological” problems.



Datacraft’s well wooded head office at North Croydon, Victoria.

One of the “real” problems facing Datacraft was the fall in the Australian dollar. Pryor said about two-thirds of the company’s revenues were derived from imported goods, predominantly from the US. Imports comprised completed goods and parts for assembly. The balance of revenues came from manufacturing equipment originated by Australian R&D.

The effect of the decline in the Australian dollar has been to force import prices up while simultaneously placing margins under pressure. However, a “fair” percentage of Datacraft’s competitors were in the same boat.

The general economic climate had also caused organisations to reassess the payback on products bought, leading to deferrals of buying decisions. But as most of the equipment sold by Datacraft was essential to many organisations’ survival, such deferrals were not for long.

Pryor said one way of counteracting the fall in grace of the dollar was to negotiate with overseas suppliers on price. They were “often responsive” to the economic pressures facing the company.

For long-term solutions to this trading problem, Pryor put his faith in joint ventures and obtaining the rights to manufacture under licence. However, all was by no means dark gloom, as the company’s manufacturing capacity provided a buffer against imports marketed by competitors.

But there are many byways adding to the complexity of import highways. Pryor noted, for example, that the price of company-made “commodity” products, those which had been tested and bedded down in the marketplace, were also affected by the falling dollar raising the cost of imported componentry.

The selling price of these products was split between componentry costs 50 per cent, and the balance taken up with manufacturing costs and necessary margins.

However, with new products or complex systems products, the equation began to swing in Datacraft’s favor as the componentry cost became less important in the total price and the R&D D element more so. One of the features of the high-technology industry was that new products very quickly became commodity products and so the cycle of researching and manufacturing new products was a continuous treadmill.

Pryor said that, with other companies also on the treadmill of product development, it could be tempting to discontinue R&D operations and for the manufacturer to rest on its laurels. However, accepting that survival was dependent on R&D, the “trick” was to market products with a higher element of home-grown expertise than competitors.

Pryor said the value-added market was becoming more popular. Organisations were increasingly requesting that the one organisation be responsible for their communications. This responsibility bridged initial consulting, supply of equipment — modified if necessary, and possibly specialist in function — through to servicing.

Increasingly, revenues would be generated from turnkey operations. Besides communications expertise, Datacraft had its R&D and manufacturing to provide specialist equipment as well as an extensive servicing operation.

On particular products, Pryor said Datacraft had secured a “substantial” contract with Telecom for the supply of self-manufactured modems, and was also in a strong position in the middle range of units which Telecom did not supply.

At the bottom end of the range, modems for connection to PCs, the company had an estimated 50 per cent of the market, but the goods were imported. Pryor’s company preferred to use its resouces for other purposes.

The prices of the mass-market products had slumped remarkably. Units once selling for $A2000 a few years ago now sold in quantity for $A200. Competition was extremely fierce. However, Datacraft was able to bypass some of this competition by modifying units to meet specialist requirements.

Telecom in the past four years has introduced new services in response to users’ needs, providing equipment suppliers with new opportunities. These serices include Austpac, Digital Data Services (DDS) and in the near future, Integrated Services Digital Network and optical fibre, now beginning to realise its promise.

Datacraft has gained from these new services with, for example, the provision of equipment to the ANZ Bank for an X.25-based branch network. Pryor said that as IBM’s systems network architecture had become a complete way of life for many organisations, X.25 was similarly attracting a dedicated following.

Datacraft supplied peripheral products for Austpac, but also a whole range of equipment for the increasing number of organisations setting up their own private X.25 networks. This equipment was imported from the US and the software from the UK, but Pryor said Datacraft added value in the network control area and also customised products.

Further, a Datacraft-made and designed modem was about to be launched for irregular users of an X.25 network who transmitted batch data rather than constantly accessing databases, for example.

While Datacraft did not supply equipment direct to Telecom for incorporation in the DDS network, a ready market existed among users for multiplexers and network processors. Also, many of the tails into DDS were via Datel lines. Here Datacraft was in a good position with its modem range.

In other equipment segments, Datacraft was successfully marketing its data private exchange, which provided many of the functions of a local area network, including connectivity and ability to switch resources. Although this mechanism did not have the universal or more esoteric applications of a true Lan, such as extensive integration, the private exchange was still most cost effective, Pryor said.

However, the market was not expanding as fast as first expected due to the ability of computers to support more terminals, the new ease of connecting computers, and the X.25 alternative.

On opportunities created by the advent of Aussat, Pryor said Datacraft did not supply earth stations or other equipment associated with satellite transmissions, but it would benefit by the general increase in data communications traffic generated by Aussat and the accompanying requirement for equipment to control terrestrial networks.

While Datacraft is not immune to the colder economic climate created by past and present Federal governments failing to make the correct economic decisions, Pryor said the Federal government had made decisions which helped the industry.

The introduction of reduced tariffs and increased bounties on modems, multiplexers and accessories was both “bold and brave,” as it would stimulate demand for these products by lowering the relative cost, would encourage manufacture, and indicated the direction that the government wanted industry to go.

Amortisation

Further, by making the amortisation of R&D investments much easier, the recent tax breaks on this investment were also most desirable in helping to overcome the handicap of a small home market.

Pryor said that Datacraft exported to subsidiary companies in New Zealand, Hong Kong and Singapore, but the volumes were not “significant”. However, the change in tariffs and bounties could encourage more effort, as could the new tendering policy adopted by Telecom which indirectly provided improved export possibilities for successful tenderers.

In its financial report for the six months to December 31, 1985 when profits fell by 14 per cent despite sales of 23 per cent, one reason given for the profit fall was increased competition from specialist companies.

In explanation, Pryor said Datacraft’s strength lay in its offering a wide range of products, but companies which concentrated on particular segments of the market had a better focus. Accordingly, Datacraft had now been reorganised into a number of small business units to provide a better product focus and improved professional attention to customers’ requirements.

This change made Datacraft much quicker on its feet, he said. Also better financial control, isolating loss-making ventures, allowed timely and appropriate action. Further, focusing and providing precise business plans gave employees in each unit a greater sense of identity and more pride in their work.

The company now had a very strong team spirit, as distinct from employees just being employees. Pryor sees this reorganisation as putting into practice some “time-worn” adages such as looking after people and providing career paths.

The industry was changing very rapidly, raising the question of when the pace would slacken and perhaps reach a steady state. If it did reach a steady state then that would be death, Pryor said.

ADVERTISEMENT

Datacraft develops a world first in Netlink

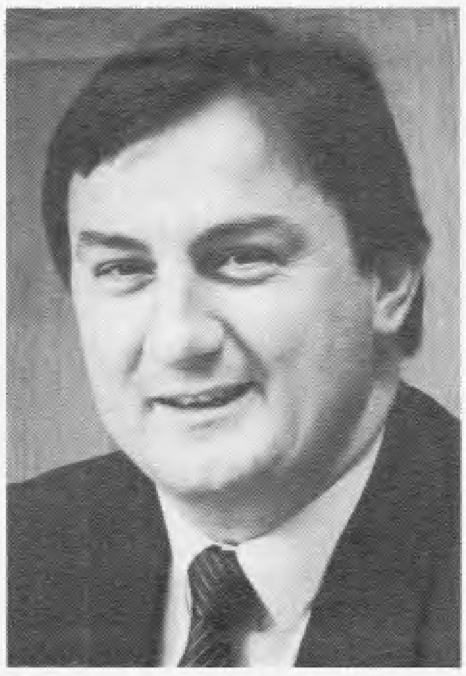
THE rapid growth of extended data communications networks within the telecommunications, financial, educational and database business sectors has created major management problems for corporate planning implementation and control, according to Datacraft technical director Russell Crothers.

"In other words, major problems for network managers," he said.

Based on its considerable experience in the design, production and support of modulation products to its commercial customer base and telecommunication's organisations, Datacraft therefore developed Netlink, a new and unique integrated collection of products, intended to overcome and correct such difficulties.

"Netlink is designed in such a way it offers extensive controls for network managers," said Crothers.

"Datacraft has developed a unique system that truly supports the needs of modern data networks. It provides an extensive and growing family of network components all sharing a common nest architecture and able to be mixed in any combination of components. The integrated network management facility allows real remote access and control of the distributed components from any point in the network via several access methods.



Russell Crothers . . . "growing family of network components".

High standards guarantee the highest level of reliability and minimal technical obsolescence" added Crothers.

"Designed around a common nest architecture with integrated network control, Netlink now provides the network manager with a powerful set of tools and components to implement centralised network management.

The Netlink system consists of four primary components: Rackmounted card nests with a group terminated wiring loom; plug in modular products sharing the common nest backplane; integrated network management in each nest and centralised and redundant access to any card in the nest.

There are currently over 20 fully integrated data communications products in the wholly Datacraft designed Netlink system and future product development projects will be designed to integrate into the Netlink system architecture.

Datacraft has already invested over three man years in the development of the Network system and anticipates it will form the backbone of its integrated data products development plans for the forseeable future.

For the technically minded, the Netlink card nest consist of a 480mm by 230mm (6RU) metal cage supporting card guides and a backplane with eight general purpose dual channel card slots, a ninth special purpose controller slot and a tenth power supply slot.

The rear backplane of the nest consists of eighteen DB25 female data connectors, eighteen sets of four wire audio blocks and two redundant power supply connectors. The audio section can be pre-wired to support a group terminated wiring loom to simplify installation.

The Network plug-in modules are based on a common card shape of 230mm height (6RU), 300mm length and 40mm width.

Cathy Walsh of Datacraft puts the finishing touches to one of the many Netlink design drawings just before production.

Each card plugs into any of eight slots in the Netlink card nest. The nest supplies power, external data and audio connection and network control access to each card via a pre-wired backplane system.

The controller card plugs into the ninth slot in the nest and under the network manager's command, can access any card in the nest to monitor, test and report on its status.

The power supply plugs into the tenth slot and provides power supply to the nest and other nests via redundancy cabling.

"The range of applications for Netlink are enormous," said Russell Crothers who has been closely associated with the design and development of this complex data communications control system during the last twelve months.

Netlink is designed to function as the central or regional nodes of high density data networks. For example, in bureau applications, database users can dial into a single Netlink cabinet fitted with intelligent Netlink 5270 auto answer V21/V23 dual modem and access up to 96 computer data channels via a single telephone access number serviced by a Telecom rotary group.

This entire network can be completely controlled by the Network Manager such that if a 5270 modem is believed to be faulty, the network controller can interrogate the suspect card to establish the number of successful and unsuccessful user calls made and then, if necessary, the modem can be switched out of the rotary group access and maintenance replacement performed.

Similarly, in organisations where high speed information transfer is required, Netlink can provide a cost effective method of system interconnection. In metropolitan areas, the Metro Modem component of the Netlink system can link offices at speeds of up to 19200-bits/sec over Telecom ADS lines and maintain full control over their network from any point in the network, based on Telecom proven 5096 modem design.

Over longer distances, long haul modems provide reliable data transfer at speeds of up to 9600-bits/sec with up to four multiplexed synchronous or asynchronous channels per modem.

Communications hub

"Although primarily directed at large network users such as banks, airlines, bureaus and national corporations, the Netlink system can equally provided the localised network manager with a very flexible racking system which will support all of his immediate needs without limiting his system's ability to expand to meet future growth needs and utilise the benefits of new technology advances," according to Crothers.

Any Netlink nest can support any mix of plug-in products and provide a very compact communications hub either as the central node of the network or as one of many distributed nodes in the system. Thus a single nest could support several dial-in autoanswer modems, several local area base band modems, operating over in-house and be connected to the network via several high speed voice band modems operating over long distance ADS wiring.

Alternatively, this remote node could be directly connected to a co-located node of a packet-switch network and thus provide low cost distribution in the region surrounding this network node.

Datacraft is obviously very proud of the Netlink system whcih is a totally Australian developed.

"Initial acceptance within Datacraft's customer base has been most satisfactory with firm commitments from several prominent Australian groups. Additionally early interest from several international corporations leads Datacraft to believe that the Netlink products have excellent export potential," said Crothers.

Voice over data capability

DATACRAFT has recently developed a new modem which is designed to provide a cost effective alternative to internal networking requirements. It is known as Telelink, it allows for simultaneous voice and data transmission, utilising existing PABX equipment and cables within a one kilometre range.

The Telelink modem is thought to be unique, and has proven to be extremely competitive in terms of price, performance and versatility and is therefore being specified in preference to other network solutions.

"It is specifically designed to reduce in-house data communications costs by utilising the existing telephone network for both voice and data transmission," said Datacraft managing director, Peter Pryor.

The Telelink modem consists of a remote destop unit and a central rackmount unit, linked through the existing twisted pair cable of the PABX network.

The desktop unit is capable of combining voice and data transmission at the telephone extension and transmits both signals over the telephone cable to the central site. The unit is contained in a slim line case which is placed beneath the telephone.

Terminal equipment connects directly to the unit via a standard female DB25 connector and the modem itself to the telephone network through a standard telephone connection. The unit is equipped with data line status indicators and a test switch for local analogue loopback testing of the data line.

The modem delivers voice signals through passive low pass filters which prevent data transmission interfering with the voice signals. This means of transmission provides a failsafe method of maintaining voice communications in the unlikely event of faults developing in any part of the data communications link.

The data transmission component of the Telelink modem supports any synchronous or asynchronous RS232C device operating up to 9600-bits/sec. The unit operates as a line driver allowing data transmission over a one kilometre area.

ADVERTISEMENT

David Wynn . . . "smart switching".

Voice-data integration

"VOICE and data communications have developed along parallel courses for many years and are only just merging into a common technology through the widespread use of digital techniques," said Datacraft Product Development Manager, David Wynn.

"In many respects, voice communications are still regarded as quite distinct from data communications and are handled by different people, funded by different budgets, with equipment provided by different suppliers," he said.

Voice and data technologists think differently, and even Telecom has separate policies and deals with them as separate subjects.

"It would appear at first sight that the digital form of voice communication cannot be distinguished from data and that the switching and transmission equipment should be identical for both.

"However, third generation PABXs are now commonplace in business and a large number of users enjoy the advantages of digital signal processing. Yet very few installations would be using a PABX to switch data, and even fewer would be using a PABX to multiplex data for transmission over distances", he said.

It seems that third generation PABX manufacturers just do not place as much importance on the data handling aspects as they do on voice.

Datacraft believes that the data PABX will continue to provide a major service to the serious data communications user for many years yet.

A purpose-built smart switch has many advantages over a multiplexer voice/data PABX — particularly in the area of user-friendliness, according to Wynn.

"By 'smart switch' we also mean switching statistical multiplexers and cable-based area networks," he said.

"Another area in which a data communications device will outperform a third generation PABX is in the shared use of high bandwidth tie lines," he claimed.

It would appear that, while a number of PABXs can be linked by 2.048M-bits/sec tie lines, none can multiplex all common speeds of pure data into the bandwidth not used for voice.

Datacraft supplies 2.048M-bits/sec time division multiplexing equipment to enable the insertion or dropping of 64K-bits/sec channels on a 2M-bits/sec tie line.

A multiplexer will then fill those otherwise unused channels with data independent of the PABX. "Why switch the data through the PABX when a point-to-point transmission system is all that is required?" Wynn said.

Single link

Smaller time division multiplexers running into 48K-bits/sec or 64K-bits/sec data lines can make available a 32K-bits/sec voice interface for connection to a voice PABX. In this way, a simultaneous voice and data line can be achieved on a single high speed link.

Datacraft has also supplied voice compressing digitisers for use on international links. The voice channel running at 2400-bits/sec can share an overseas high quality voice line with a number of data channels. If a multiplexing modem is used at 19.2-bits/sec, it is clearly possible to operate eight voice channels on a line originally intended for one.

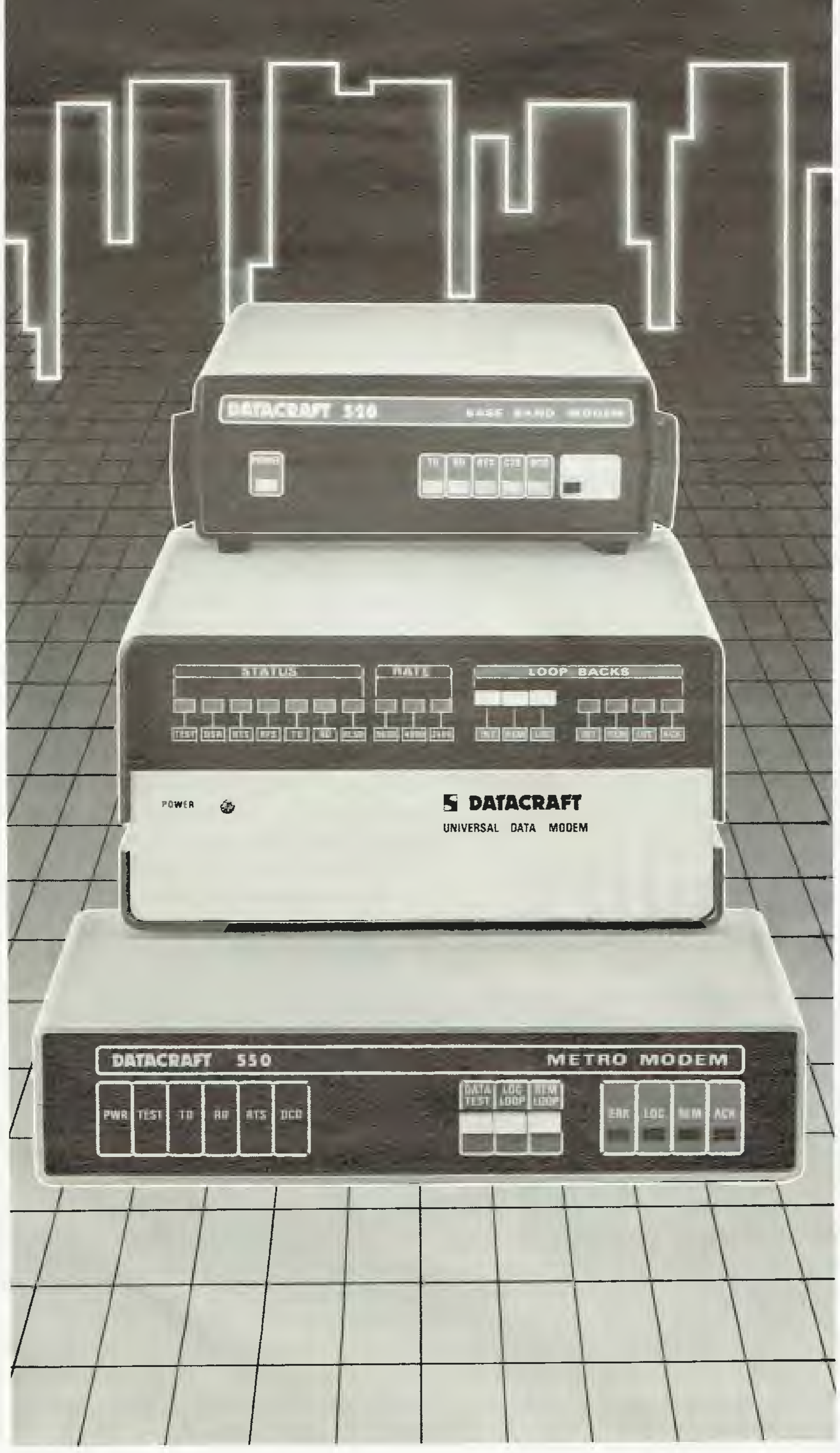
We have spoken here about some of the aspects of the integration of voice and data in the transmission context. Consider the services to be provided by ISDN as perceived by the business user.

"The ISDN user would like to have his work terminal access a fully co-ordinated and synchronised voice and data information stream. If a voice call comes in during a database retrieval session on a screen, information about that voice call should appear on the screen.

"If electronic messaging is being used, voice annotation of texts should be feasible. Even if the terminals are connected to separate networks, the telephone to a PABX and the screen to a Lan, signalling information between control and headend computers can in many cases be made to create the appearance of such service integration," he said.

"If subscriber's terminals, both voice and data, are connected to a common access line such as the 2B + D (144K-bits/sec) of ISDN, the services integration becomes easier and the access economies become apparent."

In 2 years time your leased line modems need not cost you a penny



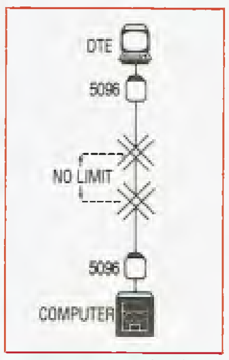
HERE'S WHY

Telecom's new ADS policy has dramatically changed the leased line modem picture. While still renting the line, you are now free to buy the modem of your choice. You still get the benefits of Datel, you own the modems, and in less than 2 years you've broken even . . . and modem rental charges are a thing of the past.

HERE'S HOW

Long-haul lines

You still rent your private line from Telecom's ADS which costs no more than the equivalent Datel line.

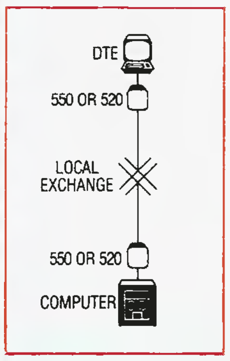


Then, by installing a pair of Datacraft 5096's, you put real flexibility and control into your network and you're on the way to saving thousands of dollars.

These Datacraft designed and built modems transmit to 9600bps over long-haul lines including Aussat. They have local and remote loopbacks and are compatible with Datacraft's Netlink Modem Network Control System. A model with built-in sync/async multiplexer is also available.

After a payback period of less than 2 years, you'll be saving around $2000 per line per year when compared with Datel.

Local area . . . up to 45km



With the Datacraft 550 Metro Modem you get equivalent performance to Telecom's LAS modem.

Speeds to 19.2kbps and a range of 45km (depending on speed and line quality) are achieved through Miller encoding techniques and adaptive equalisation.

The Metro Modem also has local and remote loopbacks and is compatible with Datacraft's Netlink Modem Network Control system.

Savings are around $1500 per line per year after a payback period of 16 months.

Across the street . . across town . . to 10km

For shorter range applications up to 10km. (depending on speed and line quality) an even more attractive proposition is the Datacraft 520 Baseband Modem.

This low cost modem transmits to 19.2kbps, sync and async with loopback. Payback is less than 12 months, then you're saving $1500 per line per year.

Of course they're Telecom approved

And wouldn't you expect that from Australia's first Category A supplier.

Start saving – call your nearest Datacraft office – today.

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Brisbane (07) 371 7655
Canberra (062) 81 1655
Perth (09) 481 0955

Adelaide (08) 79 9211
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Singapore 336 3433
Hong Kong 3 343345
Kuala Lumpur (03) 2555100

High speed is so addictive

By Luis Huesch

SPEED is addictive, as modem makers are finding out fast. The addiction afflicts communications users from the PC workstation sector, who are increasingly opting for asynchronous 2400bits/sec capability, as much as pioneering business users who press exotic 18K-bits/sec adaptive equalisation dial-up devices into service for equally exotic applications. Even the high-end corporate user who finds synchronous 9600K-bits/sec dial-up devices make a neat fallback, or even substitute, for a leased line, is not immune.

The latter species, CCITT V.32 modems, is still a bit thin on the ground. Big corporate users in the US are experimenting with these devices, available from Concord Data Systems and Codex and priced at $US3000 to $US3500.

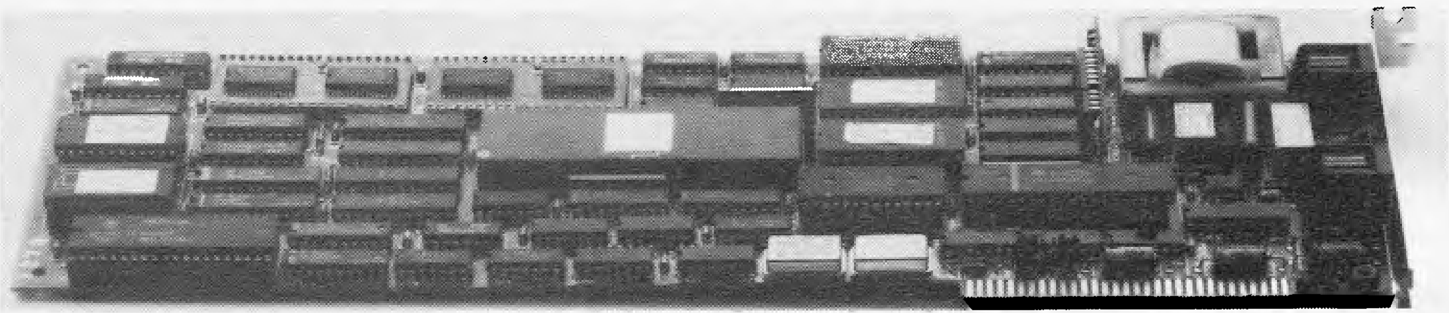
They include Ford Motor Credit, which has already replaced 77 V.22bis units (2400 bits/sec asynchronous) with V.32 devices to improve communications between 77 remote branches and headquarters. The company says it increased data flow more than fourfold in the process, from an effective bit rate of 1500 bits/sec to an effective bit rate of 6500 bits/sec.

The extra speed has an important side benefit for distributed data processing applications. In Ford's case the corporate mainframe each night polls the minis at the branches, which in turn are linked by leased line to at least one other local branch office. Once the day's credit transactions are updated — a two to three-hour process — information is played back to the branches, where the minis then run their own three to four-hour maintenance program.

At 2400 bits/sec, communications time added another two to three hours each night — which meant the entire update often could not be completed before the minis had to be back on deck for local work in the morning. Switching to 9600 bits/sec modems shaved connect time to half an hour per branch, well within the tight time frame required.

Other early US users include Dupont's Atomic Energy Division and the Los Alamos National Laboratories, both as dial-up backup for leased lines. V.32 trellis-coded modems are expected to be available in Australia from distributors such as Datacraft and JN Almgren in the third quarter.

US industry experts predict that 9600 bits/sec dial-up modems will be the fastest-growing segment of the market in the next few years. Dataquest and Future Computing believe that by 1990, about every second PC modem sold in the US will be 9600 bits/sec and above. But IDC analyst Lynne Davis disagreed with such optimistic forecasts.



18,000 bits/sec communications on a PC card — will adaptive multicarrier utilisation become a new high-speed modem standard?

"I don't think the V.32 is going to be for the personal computer market. It's too high a price, and personal computer users don't need high speed transmission in both directions." Instead, Davis predicted, the V.32 market will be specific application-driven. One key application she tipped for V.32 modems is for dial-up connection into the tail-end circuit of a leased line.

Some analysts are bold enough to predict that V.32 is one instance of technology leading applications. "It's going to be a big market, maybe one of the last big markets in the switched area," said Strategic Market Trends senior partner Greg Cipriano. "Applications will evolve as modem prices come down."

He also said Rockwell International Corp — whose chip sets are used in many of the highspeed modems now on the market — is investing heavily in the development of a V.32 chip set. Although very difficult to produce — "there isn't much field experience out there for echo cancellation for data" — and not expected for perhaps a year, their eventual appearance will push down V.32 modem prices.

Both Concord and Codex are using digital signal processing chips in their V.32 modems, and implement echo cancellation and trellis-coded modulation in software. Neither expects V.32 chip sets to be available soon.

Local market

The Australian modem market, estimated by two major players to be worth between $A25 million and $A40 million this year, is being driven to a large extent by the explosion in personal computer workstations running applications that call for

(Continued page 22)

Strong growth in UK demand

COMPETITION and deregulation led to strong growth in Britain's demand for modems — and privatised UK telecommunications services company British Telecom captured almost half (40 per cent) of the local $A210 million modem market last year.

Dataquest analysts said Racal Ltd took second place to BT with 14 per cent of the market, while Doughty Ltd — climbing from almost nowhere in 1984 to a 10 per cent share last year — took third place.

Total European spending on modems equalled $A560 million, of which the UK accounted for 37 per cent.

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It means you can choose whatever Network Software you prefer, whether it's MS Net, PC LAN or Advanceware, and still run all your favourite PC programs – now and in the future.

Then, you get access to the corporate mainframe whether it's an IBM, DEC, HP or any other, for that matter.

And, as for flexibility, no other PC LAN offers as much. A single IBM PC or clone can take the place of multiple IBM, DEC, or other terminals.

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If at some future date, you're looking for remote PC access, you won't be caught napping either. Across the corridor or across the country, the Ungermann-Bass PC LAN can incorporate Gateways to SNA, X.25; modem ports; LAN to LAN Communications; electronic mail and 2Mbps Bridges.

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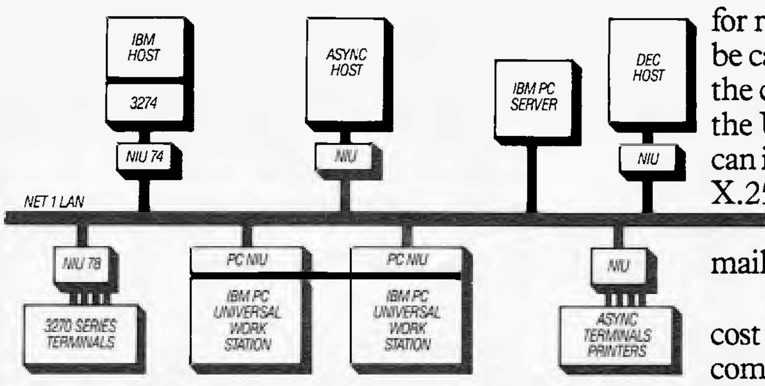

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P & P 1480 DAB

CORE REPORT/*High-speed modems*

MODEM COMPARISON CHART

Vendor/Product	Transmission compatibility				Features												Price	Comments
	Bits/sec	Asynchronous/ synchronous	CCITT	Bell	Duplex	Auto-answer	Auto-dial	Auto-ranging	Error correction	Selftest	Remote diagnostics	Analog loopback	Digital loopback	Help cues	Software included	AT commands		
CASE Case RV22B	2400 1200	both	V.22bis		full	✓		✓		✓	✓	✓	✓				$995	
SB2426	2400	sync	V.26 V.26bis	201	full	option	option										$1060	async. option av.
Quattro	2400 1200 1200/75 300	both	V.22bis V.22 V.23 V.21	 212A 103	both	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	$1986	
MS9600	9600	both	V.27 V.29		full					✓	✓	✓	✓				$2980	
DATACRAFT CDS V.22bis	2400 1200	both	V.22bis V.22		full	✓	option	✓	option	✓		✓	✓	option			$1292 ex tax	Options: ARQ error correct, stat. mux 9600/4800bits/sec.
Telenetics 5424i	2400 1200	async	V.22bis V.22		full	✓	✓			✓				✓	Relay	✓	$1160 ex tax	
5234	2400 1200 1200/75 300	both both async async	V.22bis V.22 V.23 V.21	 212 103	full	✓	✓	✓		✓		✓	✓		✓	✓	$1900 ex tax	
5096	2400 4800 9600	sync	V.27bis V.27bis V.29		full					✓		✓	✓				$2108 ex tax	Long-haul ADS. 4-channel mux version av. Rack card 5290 is $1756.
550 Metro Modem	1200 19,200	sync			both					✓		✓	✓				$876 ex tax	Short-haul ADS, also in rack card as 5250.
530 Baseband Modem	1200-19,200	both			full					✓		✓	✓				$518	Short-haul ADS.
520 Baseband Modem	1200-19,200	both			full					✓		✓					$480	Short-haul ADS.
Codex 2645	9600 4800	sync	V.29		full				✓	✓	✓	✓	✓	✓			$8160	International long-haul modem. Options: network control, multiplexer, remote configuration cap.
Codex 2665	16,800 14,400 12,000 9600 4800	sync	V.33 V.29		full				✓	✓	✓	✓	✓	✓			$14,200	
Codex 2685	19,200- 9600	sync	V.33 V.29		full				✓	✓	✓	✓	✓	✓			$21,000	International long-haul modem. Options as above.
CDS V.32	9600 4800	sync	V.32		full	✓				✓		✓	✓	✓			$5000	2-wire dial-up/leased line modem. Available late 1986.
Codex 8300	64,000 56,000 48,000	sync	V.35		full					✓		✓	✓				$15,000	Group band modem.
Muirhead 11.153	172kb/s	sync	V.37		full					✓		✓	✓				P.O.A.	Group band modem; 3-channel V.35 mux.
J N ALMGREN AS472	2400/1200/ 600	sync/ async	V.22/V22bis	212	full	✓		✓		✓		✓	✓				P.O.A.	
AS472A	2400/1200/ 600	sync/ async	V.22/V.22bis	212	full	✓	✓	✓		✓		✓	✓			✓	P.O.A.	
AM661	2400/1200/	sync/	V.22/V.22bis	212A	full	✓	option			✓		✓	✓			option	P.O.A.	2 wire. Options: 4-wire, nest card, 4-channel mux.
Codex 2325	2400/4800	sync	V29/V27bis		both						✓	✓	✓				P.O.A.	As above.
2345	9600/7200/ 4800	sync	V29/V27bis		both						✓	✓	✓				P.O.A.	As above.
AX440	50-19,200	both			full													2/4 wire leased line.
NETCOMM Trailblazer II	18,000 2400 1200 300	packet async async async	 V.22bis V.22	 212A 103	adaptive	✓	✓	✓		✓					Cross-talk	✓	$5206inc.	Optional leased line capacity.
Smartmodem 1234	2400 1200 1200/75 300	both	V.22bis V.22 V.23 V.21	 212A 103	full	✓	✓	✓		✓		✓	✓	✓	own	✓	$2060inc.	Also as PC card.
SCITEC Business 2400	2400 1200	both	V.22bis V.22	 212A	full	✓	✓	✓	(error detect.)	✓	✓	✓	✓			✓	P.O.A.	Rack mounting av. 2400C has V.25bis security dialling. 2400D offers auto-calling, eg Wang.
Business Olympic	2400 1200 75/1200 1200/75 300	both async	V.22bis V.22 V.23 V.23 V.21	 212A 103	full	✓	✓	✓	(error detect.)	✓	✓	✓	✓			✓	P.O.A.	
SENDATA V.22bis	2400 1200	both	V.22bis V.22		full	✓	✓	✓		✓		✓	✓	✓			$1375inc.	Also as PC card.
Quadmodem	2400 1200 1200/75 300	both async	V.22bis V.22 V.23 V.21		full	✓	✓	✓		✓		✓	✓	✓			$1600inc.	Also as PC card.
SHUTTLE DATACOMM Race I	9600	async			full	✓	✓	✓	✓	✓				✓		✓	P.O.A.	
Race II	19,200/ 300		 V.21	 103	full	✓	✓	✓	✓	✓				✓		✓	P.O.A.	2 separate channels.
Turbo 2400	2400 1200 1200/75 300	both async	V.22bis V.22 V.23 V.21	 212A 103	full	✓	✓	✓		✓	✓	✓	✓			✓	P.O.A.	
2424 ADH	2400 1200 300	both	V.22bis V.22 async	 103	full	✓	✓	✓	option	✓	✓	✓	✓	✓		✓	P.O.A.	Rack model available. Also as PC half card.
TELECORP Fastcomm 96	9600	packet (async to DTE)	V.29		adaptive	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	$3460inc.	Also as PC card. Separate setting of DTE speed flow ctrl.
Fastcomm Plus 2496	9600 2400 1200 300	packet async	V.29 V.22bis V.22 V.21	 212A 103	adaptive full	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	$4400inc.	Also as PC card. Flow control. DTE speed may differ from line.

The companies included in this chart responded to a survey conducted by Communications World. *All care was taken in assembling the chart. However, interested readers should check details and prices with the vendors, who also can provide further product information.*

Blazing a new trail for high speed comms

By Luis Huesch

SYDNEY — Both business and "exotic" data communications applications are the domain of a new 18.2K-bit/sec switched network modem which has just gained Telecom's approval.

The modem, which sends packetised data at up to its maximum rated speed but automatically adapts to varying line conditions, is intended primarily for high-volume cross-border data transfers, according to Steve Bishop, marketing manager of Telebit Corp of California.

But it is already being used by an oil company to link Texan offshore rigs via satellite and microwave to onshore computers, to tie a cruise ship's administration to headquarters, and to keep a Japanese fishing fleet in touch for fast exchange of catch data.

> *'We hope such regulatory artifices won't be part of our future FCC-style agency.'*

Some small US software companies use the Trailblazer to speed product development by downloading code and revisions to associates in Denmark and the UK, said Bishop. This was fast, secure, and cheaper than traditional methods, including the use of couriers.

To send a 320K-byte floppy from Sydney to London might cost $A35 by courier but a mere $A12 via dialup link with Trailblazer.

Other applications included Cad/Cam and videotex applications, which with present dialup modems could take up to 30 minutes for redrawing one screen. In the US, the Dialog database is now testing Trailblazer for graphics applications.

Trailblazer also had a place as a line impairment modem because of its capacity to monitor and adapt to line conditions gradually rather than in big steps, as did CCITT modems.

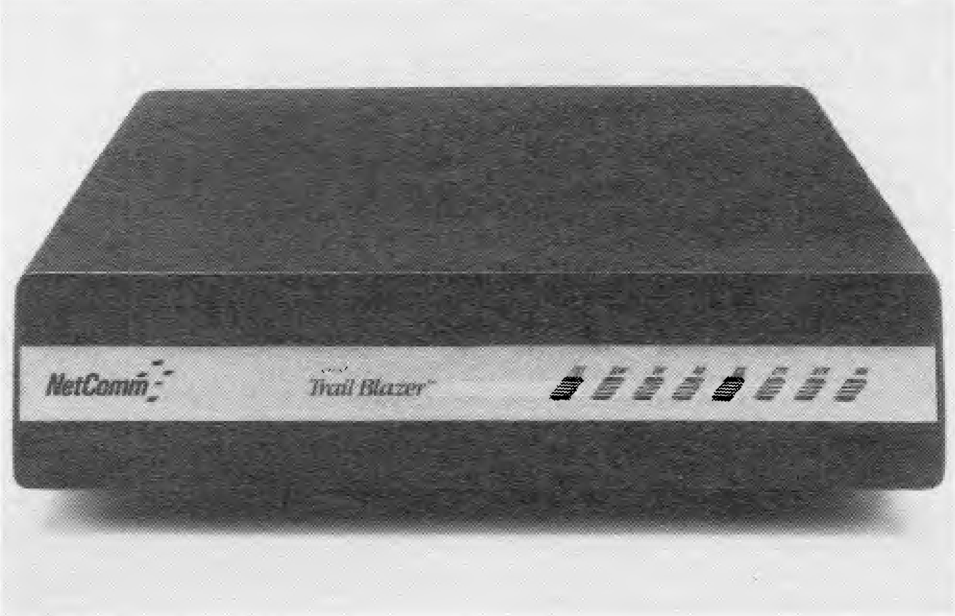
According to Bishop, the modem with its unusual technology is the forerunner of a new generation of "desktop communications processors". X.25 and SDLC protocol enhancements would come, but they were still "way down the road". A two-wire leased line Trailblazer is to be introduced later this year.

Bishop said in Sydney recently that Australian customers had benefited from the delay which held up local deliveries of the Trailblazer modem. The Trailblazer, sold in Australia by Netcomm (Aust) Pty Ltd in both standalone and PC addon board versions, not only had its maximum data rate doubled but was also made compatible with the CCITT V.22 and V.22 bis recommendations.

Bishop said there had been a "little misunderstanding on the specifications". Apparently Telecom's data regulatory branch had revised its initial advice to modem makers that an approved line isolation unit (LIU) was all that stood between the line and "exotic" equipment.

Not so, it turned out. Both LIU and device must be submitted for approval together. (One would expect that such regulatory artifices will not be part of the armory of our future FCC-style telecomms agency.)

While Netcomm designed and built a special line isolation unit and submitted the unit and modem for approval, Telebit rewrote part of the 50,000-line code stored in the modem's four Rom chips to make the device CCITT compatible.



The Trailblazer 18.2K-bit/sec switched network modem.

Previously Trailblazer could emulate only Bell 103 (300bits/sec) and 212A (1200bits/sec) when "shifted down" to slow speeds. Also added was the Hewlett-Packard Enq/Ack protocol, said Bishop.

The entire new Rom code was downloaded by satellite from Cupertino to North Ryde at 9.6K-bits/sec.

Bishop said that during the four years of deregulation in the US, the cost of dialup communication dropped 25 per cent and the cost of private line communication by up to 490 per cent.

Bishop was in Sydney on his way to Hong Kong for PTT approval negotiations. The Trailblazer has already been approved in Japan, the UK, France, Holland, Belgium and Sweden.

Bishop said Telebit was intent on getting approval in as many industrialised countries as possible in view of the increasing importance of cross-border data flows.

Sending bits to suit state of the lines

THE Texas Instruments TMS320/10 signal processor at the heart of the Trailblazer oversees the transmission and reception of 512 different carriers spaced 7.8Hz apart.

Telebit's technological breakthrough of multi-carrier operation is based on the constant monitoring of the incoming signal's carrier characteristics, dropping those that show line impairment and assigning a suitable number of bits only to the remaining "stable" carriers.

The initial extensive line analysis, with the two participating Trailblazers locking in on the suitable carriers, takes about three seconds, according to Steve Bishop, marketing manager of Telebit Corp.

Error-checking, 16-bit cyclical redundancy checks (CRC) performed by the modems 68000 CPU, automatically causes retransmission of error packets, making high-speed software transfers a viable solution.

Effective throughput claimed for the device, after error detection and correction, is more than 14,000 bits/sec.

On impaired lines, rather than dropping the connection as other modems would, Trailblazer can continue to function by selectively assigning data bits to a range of unimpaired carriers.

Another advantage claimed for the Trailblazer is better line utilisation during interactive applications. Other adaptive full duplex modems rely on flow control, said Bishop.

They could therefore not make the best use of the two-way link when applications were not symmetrical. Most are not, typically involving large data flows from a host and small replies from the remote site.

Trailblazer permitted better use of the link by constantly monitoring the line transmit buffers and automatically shifting transmit speed up or down in the opposite direction of the receive speed.

This allowed asymmetrical applications to "bang away at full speed", for instance 17,000K-bits/sec in one direction with a mere 1000K-bits/sec in the other, Bishop explained.

According to Bishop, NEC is the only company to use a multi-carrier approach to highspeed data transmission. The NEC technology was "non-infringing" on Telebit's "extremely basic" patented technology based on multi-carrier utilisation monitoring lines and assigning bits.

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Moot points in modem market

HOW long have the CCITT V.32 standard for 9.6K-bit/sec dial-up transmission and the V.33 standard for 14.4K-bit/sec leased-line transmission been in development?

V.32 has been in development for about six years and it is an approved CCITT recommendation. Every four years, CCITT holds a plenary assembly and a book of approved recommendations for that four-year period is printed.

The last book was printed in October 1984, and V.32 had been approved then. V.33 has met with preliminary approval through a special accelerated procedure used between plenary assemblies. But it is not yet a fully approved recommendation.

What are the chief benefits of these recent standards?

They are part of the evolutionary process involved in using higher speed data rates over telephone lines. The process began with CCITT recommendation V.22, designed for the two-wire, 1200 bits/sec, full-duplex modem. Next was CCITT V.22bis, a 2400 bits/sec full-duplex modem, which is becoming very popular. The next jump in technology was to 9.6K bits/sec with V.32. The same scenario followed, with leased-line, four-wire duplex modems.

First, there was the CCITT V.29, which operated at speeds up to 9.6K-bit/sec. The next jump was to 14.4K-bits/sec with V.33.

IN THE past few months, a number of highspeed dialup modems have hit the market, using novel algorithms such as trellis coding or adaptive multicarrier utilisation, and all claiming CCITT compatibility to boot. What does it mean when a vendor claims that his wares are "compatible with CCITT standards"? Industry specialist Robert Fenichel, an American delegate to the CCITT international modem committee, gives his answer in a quick modem primer in a recent interview with our US sister publication *Network World*.

Could you explain the difference between trellis-coded modulation and other techniques?

Basic modulation techniques can be illustrated in a phase and amplitude diagram called a constellation, which resembles X and Y co-ordinates from high school trigonometry. Every group of bits sent requires phase and amplitude co-ordinates.

Basically, if two bits groups are sent, two to the second power points are needed to illustrate a constellation.

The receiving modem matches what is sent, as far as amplitude and phase points go, and also assigns value to the group of bits.

At 9.6K-bits/sec, one uses a 16-point constellation with four-bit groups. Trellis coding works with five-bit groups and a 32-point constellation. The extra points enable the modem to sort and decode information more effectively.

What is echo cancellation?

When transmitting at speeds of 1200 or 2400 bits/sec, a two-wire duplex modem splits a band in two. One modem sends on the high end of the band and the other uses the low end. Echo cancelling enables the modem to work with the entire band simultaneously in both directions.

Is error checking a part of these standards?

A subgroup of the modem working party is working on error-correction standards, and the CCITT is also working in this area.

When will this standard be established?

I hope one will be established before the next plenary assembly in 1988.

Do these standards include fallback speeds?

Yes, the V.32 fallback speed is 4.8K-bits/sec, and the V.33 has a fallback speed of 12K-bits/sec.

Does the standard include recommendations for the type of transmission, such as synchronous or asynchronous?

The trellis-coded recommendations use synchronous transmission. Presently, neither recommendation includes asynchronous capabilities, although it has been brought up for study.

What does it mean when a vendor claims to be compatible with CCITT standards?

Compatibility implies that a product is one step below meeting a CCITT standard.

Fly Unite with ISDN urges AT&T

CWCI International News Service

AT&T has announced its first ISDN-compatible chip, intended for use in "mix-and-match" communications products from PABXs and digital telephone to workstations.

The chip, called Unite, meets the CCITT's recommended interface standard for communications equipment known in ISDN parlance as S and T devices. Designated T7250, the chip provides the multiplexing capabilities needed to conform to the Integrated Services Digital Network (ISDN) 2B + D basic rate specification.

This specifies that the capacity of a single telephone-type twisted pair wire be divided up into two 64K-bits/sec B channels for voice and data, and one 16K-bits/sec D channel for signalling.

Ideally therefore, digital PABXs, digital telephones, terminals, personal computers and other types of workstations fitted with such chips should be compatible. But the CCITT has not fully fixed ISDN interface standards, industry experts point out. It has said the interfaces must accomplish XYZ, but has not laid down strictures as to how this is to be done.

So AT&T's chip uses a proprietary architecture, much as the other vendors in the emerging ISDN chip marketplace, such as Northern Telecom/Motorola, Mitel and Siemens, in order to be in the running for leadership when the technical specifications are written down in 1988.

Even AT&T admits to potential incompatibility problems with its ISDN "standard" chip: "CCITT documents . . . do not always cover all of the potential problems," a spokesman said. "There may be problems between this chip and others."

AT&T's bid for ISDN chip supremacy, shored up by having the largest inhouse semiconductor production facilities of any communications vendor, is also based on what the company claims is:

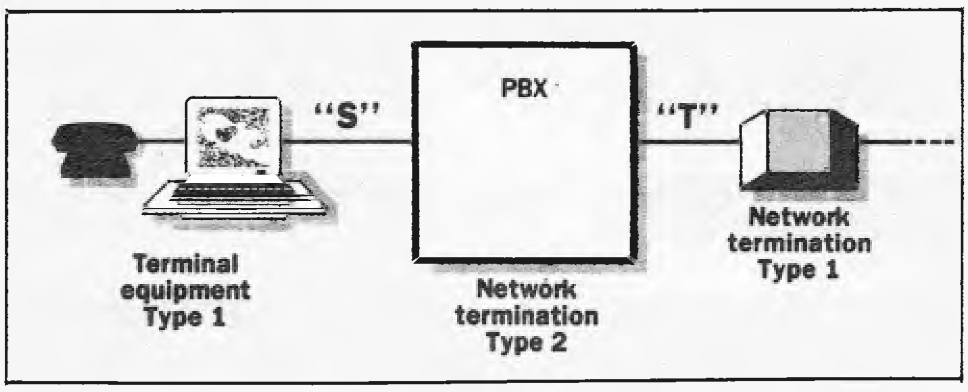
☐ better partitioning — a cleaner, more feature-packed circuit design

☐ programmable option that allows the chip to be configured under microprocessor control to support a variety of industry-standard voice encoders and decoders

☐ more flexible data support — Unite can connect the coder/decoder to one port on the chip and have a microprocessor switch it to either 64K-bits/sec channel

☐ onboard HLDLC (high-level data link control) protocol controller to give formatting support for the D signalling channel.

AT&T is now sampling the chip to other telecommunications product vendors, and full production is scheduled to start before the end of the year. There are no current second-source or licensing agreements.


"S"
PBX
"T"
Terminal equipment Type 1
Network termination Type 2
Network termination Type 1

AT&T's new Unite chip conforms to the CCITT ISDN interface standard for use with "S" and "T" devices, illustrated here as the terminal equipment and PABX.

Joint circuits deal

SIEMENS and Philips are co-operating on a standard architecture for integrated circuits that will form part of the ISDN interface. The ISDN-oriented modular architecture (IOM) chosen is said to minimise the number of VLSI circuits required and to reduce their individual complexity.

By 1990 an estimated $US500 million will have been spent on such ISDN chips worldwide in the bid to connect the first 10 million subscribers to an integrated services digital network.

Optical PABX

OPTICAL switching devices including PABXs can be expected to emerge on the market by 1990, said L M Ericsson, which claims a world first with the development of a large-scale, integrated optical switching matrix.

It consists of a single lithium-niobium chip containing 64 switching elements, described as optical directional couplers. No optical-to-electrical signal conversion is involved.

High speed is so addictive

(Continued from page 19)

database access, networking, micro-to-mainframe links or simply fast point-to-point data transfers.

New applications made possible by high-speed dial-up modems such as Netcomm's Trailblazer or Shuttle Datacomm's Race include:

☐ LAN gateway via public switched telephone network (PSTN)
☐ Remote Cad/Cam with high-resolution graphics
☐ Remote laser printing, and even
☐ Online distribution of software. At 300 bits/sec, it takes around 176 minutes to transmit a 320K-byte PC floppy. Transmission time is slashed to 22 minutes with a 2400bits/sec modem, and to around only 4 minutes with one of the "exotics" mentioned.

In the future for what is already been pushed as the PC's comms processor by the crystal gazers from Telebit Corporation lies network analysis, packet-switching a la X.25, protocol conversion and multiplexing.

In the meantime, one of the attractions for users of the Trailblazer type of modem is the fact that these units work equally well with satellite and microwave links as with dial-up lines.

It will be some time before even CCITT V.22bis modems become a commodity in Australia, but in the US, 2400 bits/sec half-card modems for personal computers are now sold for under $US300. Market leaders such as Hayes, though, still list their products at $US700 to $US800.

Still, the appearance of $US295 V.22 bis modems from Anchor Automation and others at mail order houses is a sign of the times, and will cut big holes into the leader's share of the market.

In the low end of the market, speed is not merely addictive, but becomes almost a necessity for database users who hate to see the meter ticking over at 300 bits/sec or even 1200 bits/sec. As online services add 2400 bits/sec capacity, their customers are increasingly tempted to switch to the fast lane to pay less at the toll booth. (It would be ingenuous to expect connect time to cost eight times less at 2400 bits/sec than at 300 bits/sec: the database hosts have long woken up to this threat to their revenues, and charge the higher-speed customers higher fees that offset much of the expected gains.)

With Telecom about to add 2400 bits/sec asynchronous dial-up capacity to Austpac, the outlook must be pleasing for the likes of Scitec, which hopes to zap market leader Netcomm with a new range of V.22 bis units distributed largely through Arcom Pacific dealers.

Modem makers are also buoyed by the recent bounty decision, which gives them 25 per cent of any added value — at a cost to the Federal government of some $A3.5 million a year.

Our table seeks to highlight the comparative features of modems 2400 bit/sec and up, concentrating on dial-up devices. Pricing remains a touchy subject with many vendors, who prefer to cloak their competitive position with the acronym POA (price on application). Ah well, at least they don't say "price depends on application".

CSR moving cautiously into All-in-1

By Noel Bennett

SYDNEY — One of the key ingredients for the successful introduction of "office automation" was to choose applications with immediate benefits which fitted in with long-term strategies.

However, the perceived benefits could be negated if all concerned were not prepared to use the proposed system.

Group computer facilities co-ordinator with CSR Ltd, John Cameron, augmented these observations by saying it was also essential to aim at particular areas rather than placing a terminal on everyone's desk simply because it was the "magical" thing to do.

John Cameron . . . "no terminal on every desk just because it is the magical thing to do."

CSR is moving cautiously with the introduction of DECs All-in-1 office communications system in its centre-of-Sydney corporate headquarters. That the company is testing a DEC product is no accident — this computer manufacturer is CSR's preferred supplier and has installed some 24 Vaxes in Australia, ranging from 750s up to 8600s. Head office hosts four of these machines, with Prime models.

As Cameron said, with the one supplier providing software and hardware for both standalone and communications mode, the overall system was easier to maintain and avoided the requirement to build bridges between different makers' systems.

Progress towards a pilot All-in-1 application comes after some years' experience with networking.

Examining the headquarters site, the four Vaxes are interconnected by a 10M-bit/sec Ethernet link to allow terminal users to move between processors and also to allow integration of information held on different machines.

These users are channelled into the Vax complex and also into Prime machines by a Micom port selector, which also avoids the need to recable when staff move within a building or between buildings.

Micom units are also installed in Brisbane and Adelaide. These and other "remote" divisions are connected to the Sydney hosts via Dec-net over either 4800 or 9600-bits/sec lines.

Altogether about 2400 terminals, including 300 Decmates were connected into the Vax population.

Cameron said CSR completed a study about three years ago on the benefits of introducing a Lan, but it was decided that this would not offer many more advantages than the straightforward terminal switch. However, the introduction of personal computers and their need to move reasonably large amounts of data from the hosts has revived interest in this connection.

In the secretarial and general management fields, the company standardised on Decmates as they provided data and word processing as well as communications facilities within one machine.

Most of the 300 Decmates scattered throughout the organisation were linked through the Vaxes, so providing electronic mail facilities. The All-in-1 pilot studies in several different areas of CSR had found that most people had little trouble in learning to use the word processing and electronic mail.

The advantages accrued to those who solved everyday work problems, rather than treating the terminal as "magical."

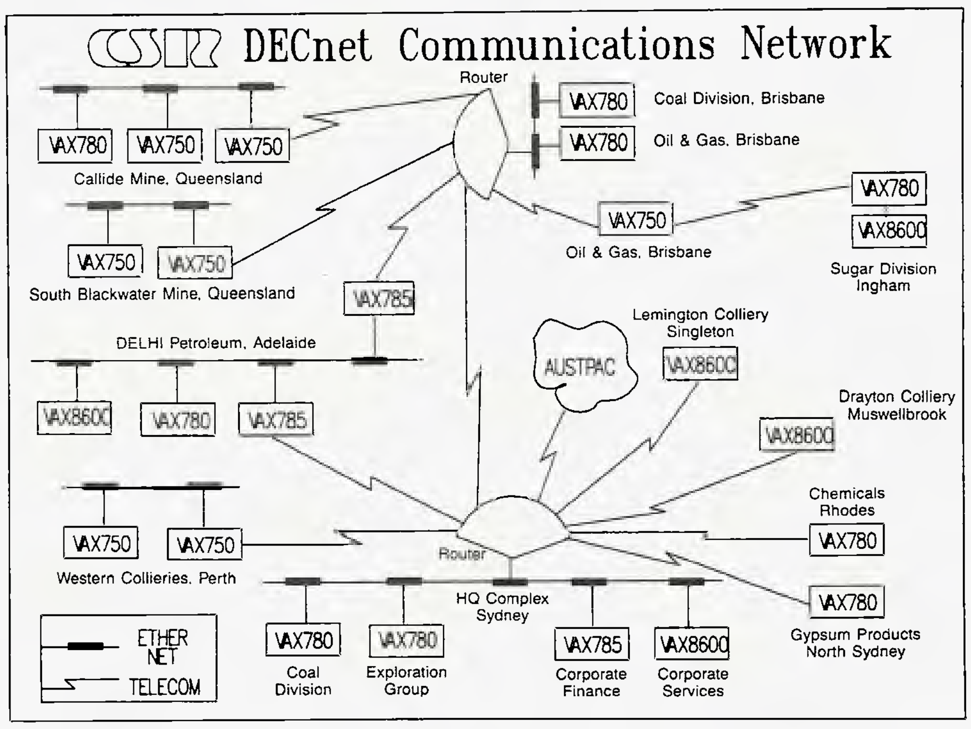
Cameron cited the case of a manager involved in the partial sale of one of CSR's activities who prepared the documents himself with All-in-1 and sent them electronically to all the staff involved including the activity being sold, without secretarial assistance.

This procedure ensured that one set of documents was available to all involved parties simultaneously.

Other benefits for the manager included improved preparation for negotiation and better liaison with colleagues and management. The manager considered his direct control over the production of documents invaluable, as so much work was done outside normal business hours.

Word processing, electronic mail and telex interfacing facilities of All-in-1 were now being used. Calendaring was considered to have no practical value — "a notebook is much better".

Spreadsheet facilities were also available under All-in-1. Standalone Decmates were used for heavy loads of word processing, for example by secretarial staff.



Cameron noted that some people thought of office "automation" in the same way as factory automation, but the two things were entirely different as it was difficult or impossible to quantify the actual output of some office workers.

Cost/benefits

Accordingly, if considered solely in terms of strict cost/benefits, the installation of equipment could not be justified in the usual ways.

Some of the other long-term advantages seen as possible with wider implementation of All-in-1 included better communications within groups of people who worked together even when they were geographically dispersed, and greater flexibility in siting departments.

CSR met two problems at first in setting up the All-in-1 pilot study.

First, the response times were "not very good". This was overcome by CSR's re-organising how files were held on the disks and writing a small program to change the way the Vaxes scheduled jobs.

Second, while users met few problems, some software difficulties were encountered at system administration level.

Cameron said such problems were understandable, given the power and flexibility of the system, and "DEC was very responsive".

Among other lessons which Cameron learnt from the introduction of terminal equipment into offices was that staff should not share equipment, they must be given adequate time to learn how to use the machines, and letter quality printers should be available within comfortable walking distance.

Some passive resistance had been met from managers who were reluctant to use a keyboard.

This was one of the reasons the company thought high-benefit areas were where office automation would be viewed as a necessary tool.

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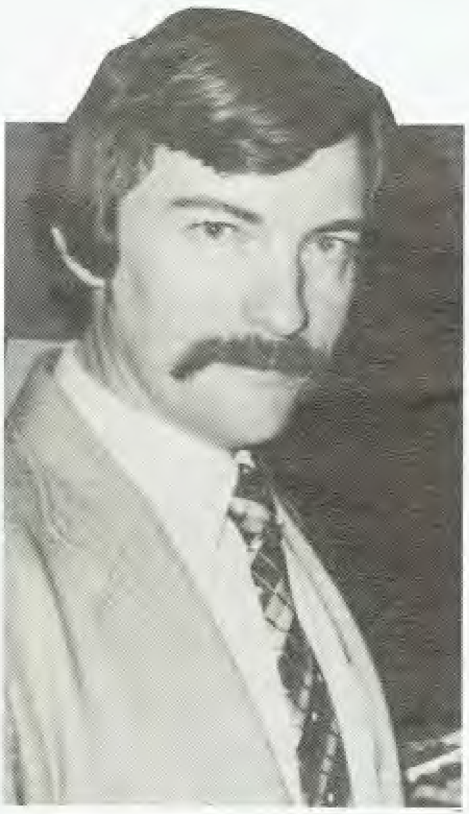

Garry McMahon . . . *first communications manager.*

AGL cooking with gas

By Noel Bennett

NORTH SYDNEY — Computers and communications are destined to play a key role in new business opportunities at the Australian Gas Light Co (AGL) following momentous legislative changes last year.

Essentially, these changes allow the company to engage in operations other than providing gas. Also, while some activities such as the supply and pricing of gas in NSW are still regulated, other activities are free from specific government interference.

After an earlier revamp of computer operations, the company is now placing increased attention on communications with the appointment of its first communications manager. He is Garry McMahon, formerly executive technical director of the Australian Telecommunications Users' Group (Atug).

Manager, information systems, Barrie Lewis, said the objective generally was to develop a co-ordinated strategy for wide area and local area networks so that the best advantage could be taken of present and new facilities and technologies.

The corporation has two IBM 3083s running under MVS/XA with a terminal network of 500 terminals, 300 in the North Sydney headquarters and 200 remote, handled by CICS/TSO. The Adabas database from SPL is implemented, with programs being written in the complementary fourth-generation language Natural, and endusers being encouraged to use Supernatural.

In addition a Systems/36 is installed in Newcastle, acting as an intelligent node to the network as well as processing local work, and the company has installed some 50 IBM PCs, mostly XT models, and 40 IBM Dislay Writers.

Lewis was appointed to his position five years ago when the company recognised it is not optimising its use of computers. Three different organisations then controlled the computer complex: operations reported to accounts, systems and programming to finance, and operation research to technical services. Further, they did not always talk with one another when they should have.

This chain and division of command was rationalised with the appointment of Lewis, who reports to the general manager, finance, one of a five-executive committee. The company also approved recommendations that the then computer system, an IBM 4341 and 3031 running under Dos and with an IBM database product, UDB be upgraded to the present installation.

The growth in communications is highlighted by 200 terminals online two-and-a-half years ago growing to the present 500. The network is operating continuously.

One of the reasons for "taking a great deal of trouble" to standardise on IBM products was the bonus of not having undue concern with interfaces in the context that communications technology was advancing faster than computers.

However, this rapidity of change in telecommunications was such that developments could not be digested much faster than they were now with, presumably, McMahon being invaluable in helping this digestion.

The wide area network now comprises 9600Bits/sec DDS lines linking the North Sydney headquarters with five country centres. A Datel backup line augments one of these lines and Datel lines provide links at the Mortlake, Sydney, operations and also some showrooms in the metropolitan area. At headquarters, links are yet to be implemented between the PCs.

Remote net control tool due soon

By David Legard

CROWS NEST — UK mainframe company ICL is beginning to market advanced communications equipment developed by its parent company Standard Telephones and Cables (STC).

One of the first to be released will be a sophisticated digital multiplexer known as PDMX, which can dynamically alter the configuration of a network in response to commands from a remote control site.

A typical application would be for a company leasing a high-speed line from its national telecommunications carrier, handling mainly voice traffic in the daytime, and transmitting only data during the night.

Another spin-off from ICL's takeover by STC has been the mainframe company's recent moves into the Value-Added Network (Van) arena.

ICL has recently entered into a joint venture with Cable and Wireless subsidiary Mercury Communications in the UK to offer an alternative public packet-switching network to British Telecom (BT).

ICL and Mercury will market information transport based on the X.25 standard, and will provide a wide range of protocol conversions for its customers.

The second joint venture is with information services company Geisco, to set up an information network for use by international trading organisations.

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JAMES 057

NEC outlines strategy for supremacy in telecomms

By Noel Bennett

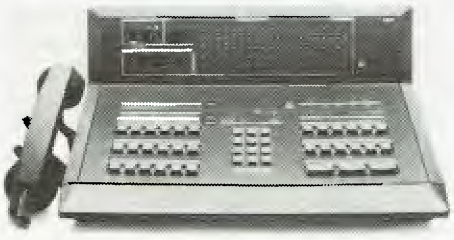
MELBOURNE — The facts take a little time to digest: One company is the world's leading supplier of IC's, is sixth among communications equipment suppliers and comes in at ninth place in computers.

With electronic components being the common building block, it is no wonder that the corporation uses "C&C" — Computers & Communications, on its calling card.

Don Kordick, assistant general manager, marketing, NEC Australia Pty Ltd said the parent corporation, NEC, Japan, adopted the philosophy of "C&C" as far back as 1977, believing that a massive synergy could be gained from these three areas.

In Australia, NEC Australia Pty Ltd handles telecommunications and electronics, NEC Information Systems Australia Pty Ltd handles computers and NEC Home Electronics Australia Pty Ltd deals with consumer goods.

Kordick said NEC aimed to be number one in Australia in telecommunications, an achievable objective, but not easy. The company estimated that it was now third or fourth.



NEC's Neax PABX console.

Factors which could take NEC to top position include its range of products, seemingly covering the entire spectrum of communications from earthstations at one extreme to telephones at the other.

Achievements and plans for products as detailed by Kordick include:

■ **PABX** — Selling to Telecom and direct to the private sector, the company believes it is the leader with about half of the market.

The flagship is the Neax 2400 series which, it seems from talking with major companies, is being installed at an amazing rate of knots. This observation is backed up by Kordick's saying NEC has supplied 11 of the top 20 companies and more than half of the top 500.

The small range, the Neax-D3 series, is also selling well. While customers are confining their 2400 applications to voice traffic at this stage, they are investing for the future by specifying that data-switching facilities be available in delivered machines.

■ **Modems** — In line with intentions to be more involved in data products, NEC is to lift its presence in the modem market. It is the top supplier in Japan.

While the rate of growth in leased line modems is beginning to slacken, the market for dial-up units is increasing. NEC will develop and manufacture modems here in line with its plans for greater manufacturing participation. The company will soon be able to offer a 14.4K-bits/sec modem with multiplexing through six ports.

■ **Multiplexers** — In the "future," NEC will also introduce a 2M-bit/sec statistical multiplexer.

■ **Facsimile** — Estimates said this market is growing by from 50 to 100 per cent a year and NEC again straddles the range from low-medium units to the top-of-the-line mode, the Nefax D35.

This unit has a 20M-byte memory and is claimed to handle both Group III and IV standards so that Group III machines, in the surburbs for example, can communicate with a Group IV machine in the city which can then communicate with a similar machine in a distant city with the same tail lines.

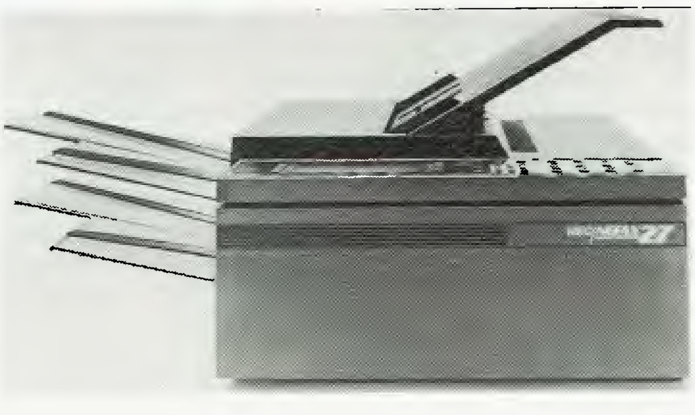
NEC has recently introduced a low-end machine, the Nefax II, which sells for under $A3000 through dealers. It is a basic machine with only four buttons.

NEC estimates that the present facsimile population is from 20,000 to 25,000 machines and the telex population is about 42,000. It believes the cost/efficiency and ease of use of facsimile machines will drive their numbers up to 100,000 or even 200,000 units in the relative short term.

■ **Telephones** — A contract to supply premium telephones to Telecom will result in local design and manufacture.

■ **Semiconductors** — NEC will be taking a more active and aggressive role in the Australian market, estimated to be worth $A120 million a year. The company also supplies an array of other products to the Australian market — microwave point-to-point systems, multiplex equipment for optic fibre cabling and television and FM transmitters, to name but a few of the corporation's total 15,000 products.

NEC satellite earth-station. Rooftop units like this will figure highly in business communications.

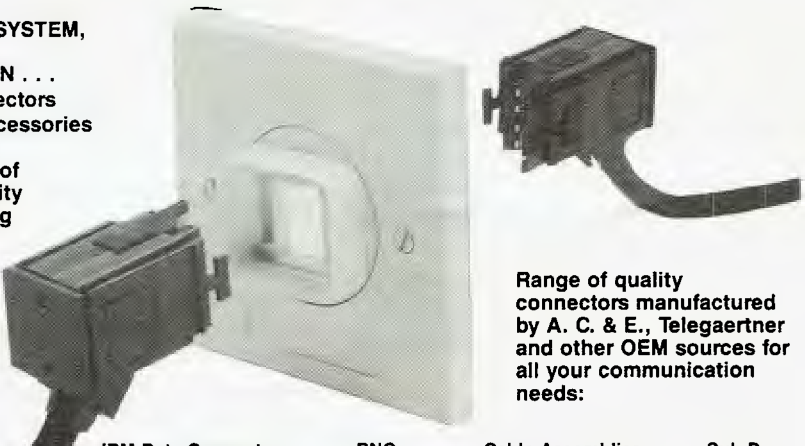


The fax market, growing at from 50 to 100 per cent a year, is covered by NEC across the range.

Scitec now in category 'A'

SCITEC Communication Systems Ltd has gained Telecom Category A status as one of the select few companies which can certify their own data terminal equipment such as modems and multiplexers for connection to communications networks.

The approval for Scitec, which recently set up Modem Technology to cater specifically for the expanding modem market, "recognises that our continuing investment in R&D . . . means that Scitec can remain very competitive with major overseas suppliers," said general manager, engineering, Joe Younane.



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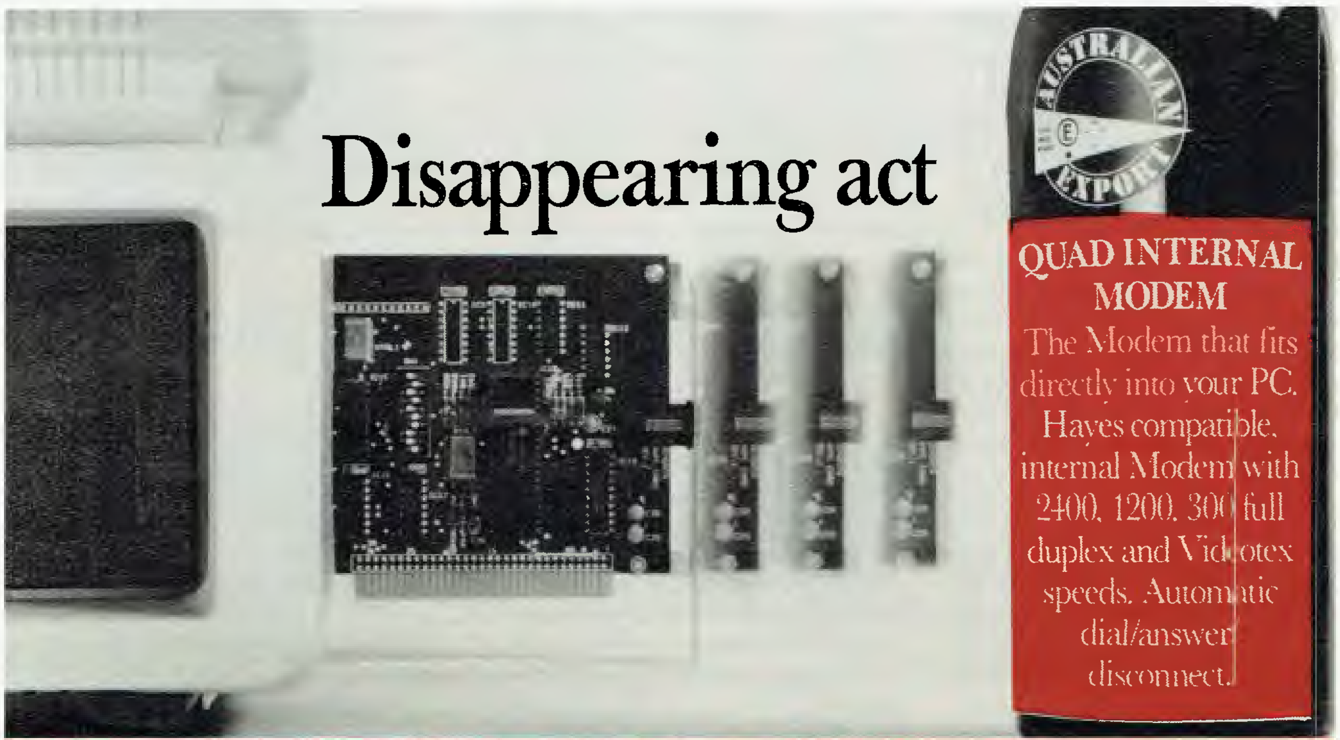

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One network for all is for ISDN

By Stephen Coates

THE explosion of data communications over the past decade, which has spawned such technologies as the Lan, digital PABXs, digital facsimile, Teletex, voice messaging, packet-switching and fibre optics, has been characterised principally by a divergence of communications facilities.

However, many of these technologies are, in fact, not only compatible but well suited to integration.

To provide a single network catering for all communications services is the goal of the ISDN.

Conceived back in 1972, the Integrated Services Digital Network is designed to be a single network, which not only integrates all voice and data services but provides them to both business and residential subscribers through an ubiquitous interface. Such a network can be successfully implemented only if it is entirely digital.

Despite its early inception, many of the technologies required for the ISDN were not developed until recently. As the technological barriers to the ISDN were overcome, the CCITT began to promote and standardise it. Study groups have been doing this since 1980 and the first trials took place last year.

As previously mentioned, one of the key elements of the ISDN concept is the interfaces it defines. It is intended that all services be delivered to the user multiplexed through a single interface.

Where that user is an individual employee in an office or a residential subscriber, a basic interface, with "2B+D" signalling will be used. This "2B+D" interface will provide two 64K-bits/sec "B" channels, one for voice digitised using PCM A-Law, and the other for data, and a 16K-bits/sec "D" channel for signalling.

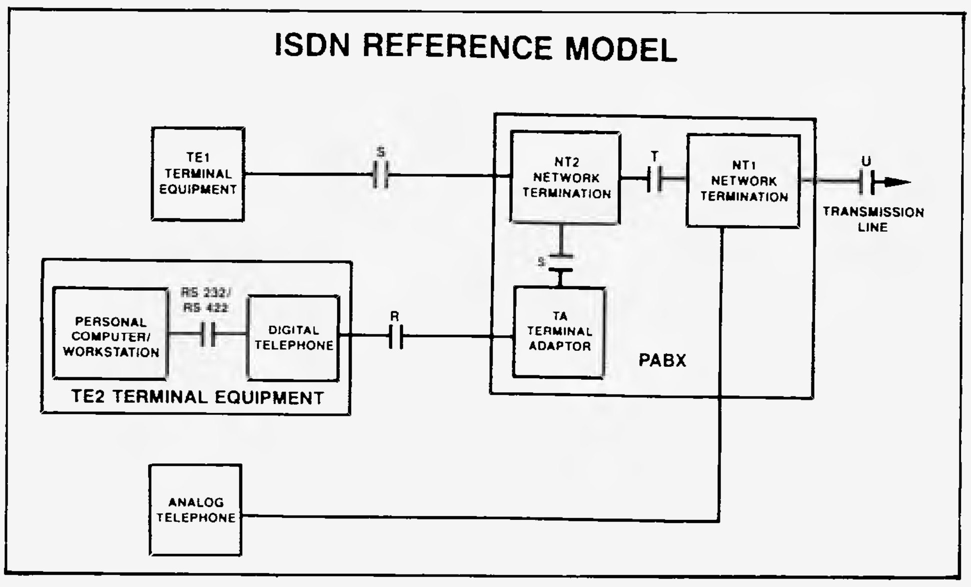
This "D" channel is one of the most significant aspects of the ISDN. In a break from existing PABX, telephone and computer interfacing, all signalling information (on or off-hook, dialled digits, charging information, data destination), is carried through a separate channel. Furthermore, the signalling information for the voice and data channels is carried together, using packet switching.

Although the sum of the channel speeds is 144K-bits/sec, the addition of framing and synchronisation bits brings the total speed to 192K-bits/sec. Furthermore, to operate full duplex over single pair cable, echo cancelling must be used. Several companies have already produced chips providing this two wire "2B+D" interface, including Mitel, Siemens, AMD and Motorola.

Where more than two 64K-bits/sec channels are required, a primary rate interface, will be used. This interface will have a "23B+D" channel structure when a 1.544M-bits/sec trunk is used, and "30B+D" for a 2.048M-bits/sec trunk. In both cases, the "D" channel will operate at 64K-bits/sec using CCITT No. 7 common channel signalling protocol, and the 23 or 30 "B" channels can carry any mixture of voice and data.

In addition to defining the interface in terms of the channels it contains, the hardware elements are also specified. As shown in the diagram, there are five functional elements, and four reference points in an ISDN termination.

The line terminator (LT) is equivalent to the plastic wall plug that terminates the wiring from the Telecom exchange. The network termination 1 (NT1) provides the ISDN standard "2B+D" interface to the user in accordance with OSI Level 1. However, this interface will use a new eight-wire connector with two wires for transmit, two for receive and four for power. The NT1 is functionally equivalent to an NTU or modem.


ISDN REFERENCE MODEL

The next element in the chain, the network termination 2 (NT2) implements OSI levels greater than one. It is an optional device which can provide multiple "S" interfaces. PABXs, local area networks, and terminal cluster controllers are all examples of this type of device.

As the "S" interface is still in the "2B + D" format, terminal adapters (TA) will be required for certain types of terminal equipment (TE).

Some of these functional elements may be combined. For example, an ISDN PABX (NT2) may provide integral terminal adapters. A cluster controller (NT2) may have its own physical level network termination (NT1).

Reference points

The reference points define the boundary between the common carriers' and the users' responsibilities. In the US, FCC regulations currently require that this be the "U" reference point. As the transmission technology between the NT1 and the local exchange is ill defined, separating the carriers' and users' responsibilities at this point will be difficult to implement. As a result, it appears the FCC may be persuaded to change this ruling.

Terminal equipment can be connected directly to the terminal adapter, the network termination 2, or the network termination 1. In each of the three cases, one or more terminals, including digital telephones, can be connected in a multi-drop arrangement on a passive bus, and contend using Carrier Sense Multiple Access with Collision Detection (CSMA/CD).

In addition to integrating voice and data services into a single network, the ISDN will provide many new features, including: fast call set up (2 seconds); calling party identification; call queueing with call waiting indication and calling party identification; registration of unanswered incoming calls; call diversion and forwarding; online call charging information; abbreviated dialling.

The provision of the two "B" channels offers several additional possibilities. Documents could be faxed between two users (using Group 4 facsimile machines) on one "B" channel, while they talked using the other. If both were used for voice, stereo sound could be transmitted. While not many telephone users will be keen to put a telephone receiver in each ear, this would be very useful for videoconferencing.

The major impact of the ISDN, however, will be on the provision of non-voice services. The "D" channel, in addition to providing signalling for the "B" channels, will give end to end low speed packet switched data. With a "2B+D" interface in every home, this can be used to telemeter use of electricity and water. One proposed ISDN installation in the US is expected to be paid for by this one application.

Internally, the ISDN will use both circuit switched and packet switched technologies. One impact of this is that it will generally not be possible to split a high speed data source into different 64K-bits/sec streams, transmit these on separate "B" channels, and have them arrive at the destination in exact synchronisation. Nevertheless, channels with higher data rates, including 384, 1536, and 19.2K-bits/sec are being considered.

Because the ISDN will provide all services, existing and new, through this "2B+D" interface, requests for service can be provided on a relatively short notice. Furthermore, the use of this single interface will promote advanced standardisation. Telecom Australia is planning to introduce the ISDN's 2B+D interface on its AXE main exchange equipment by 1988.

- *Stephen Coates is project manager with Lend Lease.*

Prototype for tests set to roll

CWCI International News Service
By Elisabeth Horwitt

OSINET, a prototype network developed jointly by 25 US vendor and government organisations, was due to begin operations before the end of August, with its first commercial test scheduled for September 1.

Ultimately, the project will guarantee business users that computer and networking products from different vendors will exchange data and documents using open systems interconnect protocols.

Vendors can use OSInet to test products for conformity to the OSI communications protocols being developed by the International Standards Organisation.

The first test to be conducted on the network will determine system interoperability using the OSI file transfer access method (FTAM).

The OSInet project is one of the first carried out in co-operation with the Corporation for Open Systems (COS), a user and vendor organisation founded to coordinate and provide direction for OSI standards development and testing efforts.

If plans now in the works go through, OSInet participants will also be able to conduct interoperability testing with European vendor sites, a spokesman said. At least two demonstration OSI networks are operational overseas, one in Italy and one in the UK.

The OSInet project will be co-ordinated with the efforts of other standards organisations such as NBS, the Map Top Users Group and COS.

Australia joins push towards OSI

By Noel Bennett

AUSTRALIA has joined Europe and the US in the move towards allowing communications applications to be independent of the computers used in a network.

ICL Australia Pty Ltd teamed up with the Csiro Division of Information and Technology in a venture to allow easier development of Australian products to Open Systems Interconnect (OSI) standards and so enhance opportunities in the export market.

ICL's parent, ICL Britain, is a leading participant in Eurosinet, made up of key computer suppliers who are co-operating in demonstrating OSI running on their equipment.

Eurosinet recently demonstrated in London what it claimed was the first OSI over a wide area network. Besides ICL, participants included Honeywell, Intel, DEC and Hewlett-Packard.

In the Australian venture, ICL is investing $A500,000 over three years by way of access to the company's experience, donations of products and secondment of staff.

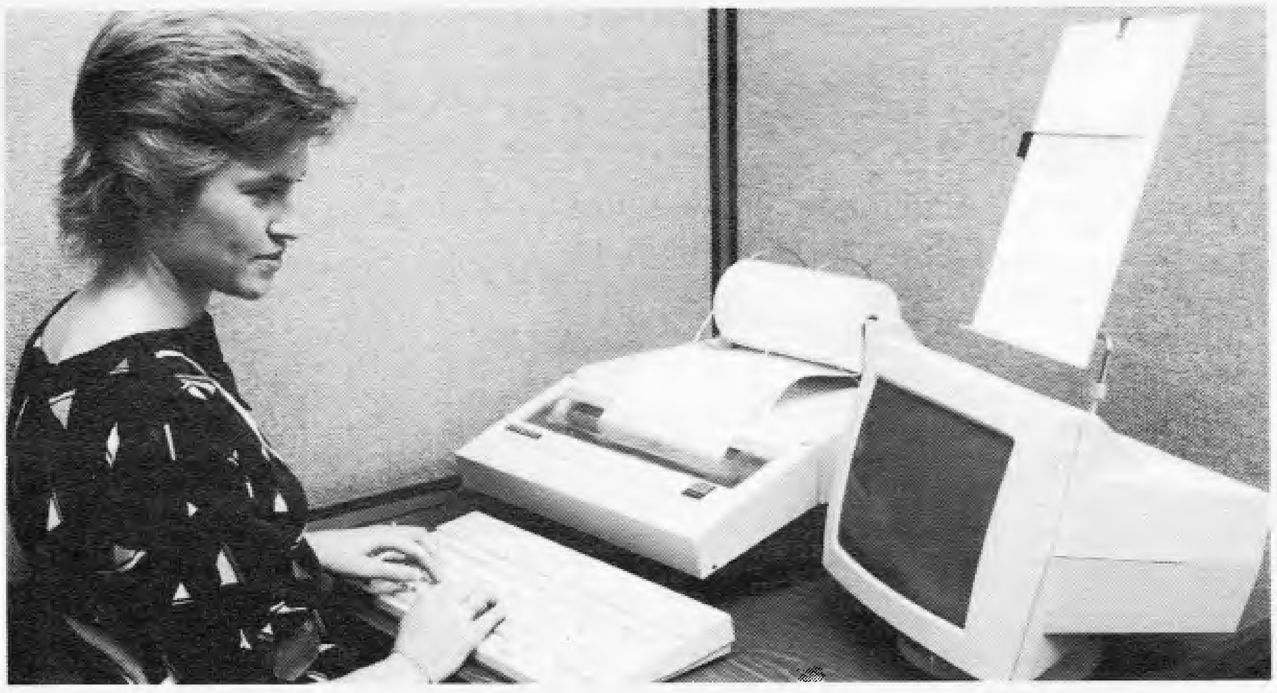
ICL is the initiating supplier in the project, but other suppliers are welcome to participate. The head of the Division of Information and Technology, Dr Tommy Thomas, said he would be inviting IBM Australia Ltd to join. IBM corporate is a member of the US counterpart to the European and Australian projects.

The ICL-Csiro venture will initially concentrate on the CCITT X.400 standard for electronic messaging.

Experimental centres and showcases are being established as rapidly as possible in the division's laboratories in Sydney and Melbourne, with links to the division's laboratory in Canberra, the computing discipline of the Department of Mathematics, Macquarie University, and the Csiro Division of Radiophysics, Epping.

Operationally, Ethernet networks with X.400 messaging hosts within the Division of Information Technology, North Ryde, and Macquarie University are to be linked via infra-red laser signalling equipment supplied by Scitec and with an ICL-developed bridge between the Ethernet networks.

An Ethernet-to-X.25 gateway, supplied by ICL, will provide connection through Austpac and Csironet to other Australian and overseas sites where trials of X.400-conforming products will be arranged.



Telex 2001 out after long delay

TELECOM has released its new telex machine (pictured), a modular teleprinter/screen package from Sagem called the Telex 2001, after months of delay which it says was because of "user trial".

The new system is offered at first as a keyboard/printer package, to which users can add the high-resolution screen unit as required. A separate 500K-bytes 3½in disk drive module is to be offered later. The processing unit has 32K-bytes of user-accessible memory, permitting the preparing and editing of messages without interruption from incoming messages. In local mode Telex 2001 features extended word processor functions with lower case print and tabulation.

Text can also be stored for subsequent editing or delayed transmission to save communication costs. Automatic calling and retransmission facilities are part of the system. Telex 2001 also features multi-addressing, answer-back verification, automatic message numbering and logging, abbreviated dialling, and the ability to alter screen parameters from the keyboard.

Vax Unix interface with Map

CWCI International News Service
By Elisabeth Horwitt

A NEW interface from Advanced Computer Communications enables any DEC Vax minicomputer running Unix to communicate with other devices over a local-area network based on the Manufacturing Automation Protocol (Map) standard.

MapVX enables a Vax running BSD Unix 4.2 or Ultrix-32 to communicate with any other device equipped with a Map 2.1 interface, said John Risque, ACC director for program development. The device implements all currently completed Map protocols, he added. Map is a set of networking specifications based on the IEEE broadband token-bus standard, and designed for factory communications.

The growing number of Map interfaces from Advanced Computer Communications, Industrial Networking and Motorola "are not significant until Map specifications are finalised," commented Dale Kutnick, a senior analyst at the Gartner Group of consultants.

Map Version 3.0, which should be available late this year or early in 1987, "will have more capabilities than the current version," Risque admitted. "Our intention is to meet 2.1 specifications and upgrade to the 3.0 version of Map when it becomes available early next year."

MapVX consists of a front-end communications processor board, a broadband RF modem board, and Vax-resident software. Upper-level Map communications protocols that are included with the software "provide a framework for applications to be written either by software developers or the manufacturers themselves," Risque said.

File Transfer and Management software handles file transfer between different devices. Manufacturing Message Service "provides a hook for applications that send commands to robot devices," Risque noted. Common Applications Services Elements provides a common interface for applications that run on top of a Map network. And Network Management Agent provides a common interface that enables MapVXs to send network statistics to a network management host for monitoring and analysis.

Scheduled for beta test in the third quarter, the MapVX has a target price of $US10,000, Risque said. Advanced Computer Communications plans to come out with a Map interface for Q-bus systems such as Microvax II by the end of this year, he added.

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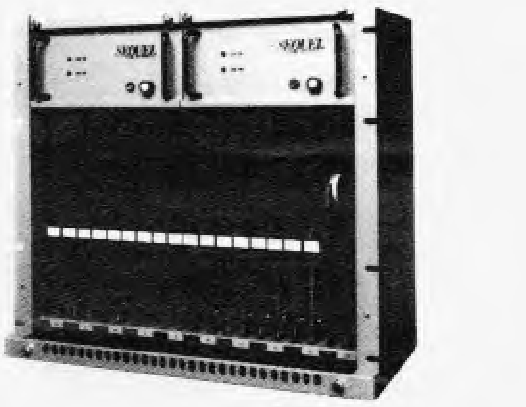

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Case is betting on *two* switches

By Noel Bennett

CASE Communication Systems Pty Ltd has adopted a "back door" approach to front desk switching facilities. The PABX market is now being educated by suppliers of the virtues of installing third generation PABXs, handling both voice and data. The advent of ISDN is being used to underline this approach.

However, Case is now supplying a range of specialised private data exchanges (PDX) arguing that two exchanges, one for voice, the other for data, are better than one. Advantages seen lie in cost, ease of installation and use, network management control, and coping with extra traffic loads as well as main host failure.

Models offered by Case include the Smart Switch (SS), Distributed Switch (DS) and Matrix Switch (MS), covering local area network switching up to handling traffic to and between mainframe hosts.

Advent of the SS has been prompted by the eruption of personal computers and the requirement to link them inexpensively so that hardware, software and information resources may be harnessed more fruitfully. As against a switch, Case holds that conventional Lans have drawbacks including the requirement of some Lans for coaxial cabling. The switch can use twisted pair cabling.

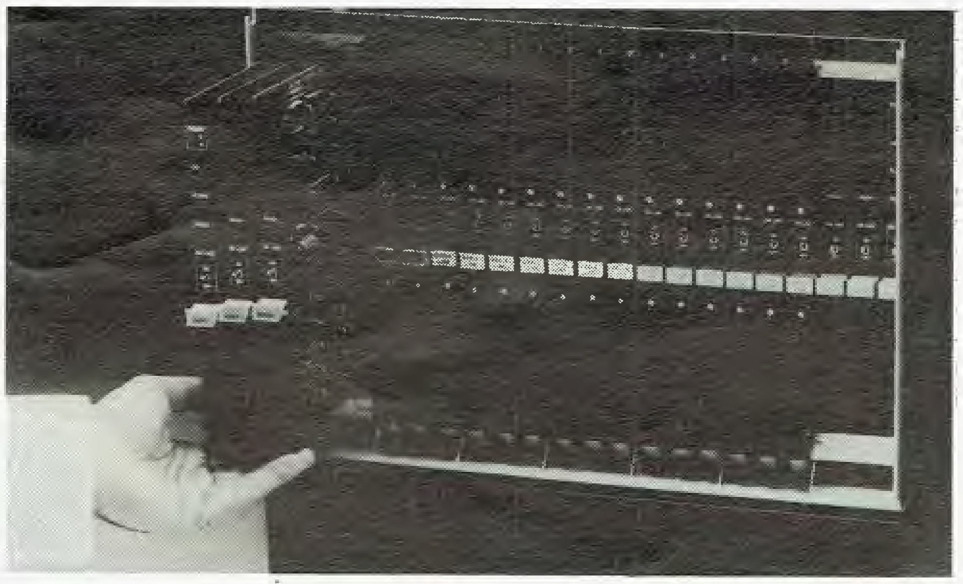
Further, it is possible for bus and ring Lans to go down completely, whereas with a star or switch topology, failure of one path will not jeopardise the whole system. Transmission is via a dedicated physical path.

Also, a central switch avoids extremes of contention for a particular resource. The PDX range can also provide easy user access from PC or terminal to hosts or various hosts and fallback switching. The investment in hosts can be reduced, since fewer ports are required on the host to support access ports.

According to Case, the argument for dedicated data switching extends to network management, access security and call accounting, switching between separated PDXs, inter-Lan switching and remote networking, say out to an X.25 network.

The SS is for small user application and comes with either eight or 16 ports. Case claims simplicity of use, with one-letter commands and help facilities available.

The model allows users to create their own any-port to any-port Lan, integrating personal computers, peripherals, terminals and modems, with each individual port being allocated a name and configured for baud rate, parity, handshake protocol and a disconnect message. The system command port allows the user to connect and disconnect remote ports as well as monitor data activity on selected ports. Through the broadcasting feature, a message can be sent to all or selected ports, Case said. The eight-port system sells for about $A2000.



Two exchanges are better than one. The Case PDX.

The DS units are aimed at installations of minicomputers with the DS-5 providing from 120 up to 1320 lines for computer ports and terminals. The larger DS-15 supports up to 1320 ports, but with optional dual redundant backup and multiplexers allows local area applications to be enhanced with up to 48 ports, connectable at distances of up to 1500m.

Case said a typical price for a 100-port DS model PDX is about $A27,500. The top of the PDX range, the MS-7300 matrix switch, caters for high-speed port sharing and selection in mainframe and large minicomputer installations.

Further, traffic can be switched between multiple synchronous host computers in case of main host interruption. Case said the matrix switch automatically allocates a data path at speeds of up to 64K-bits/sec for each of the 16 up to 1936 ports available, and all connections are completely transparent allowing the MS-7000 to support all terminal types operating up to 19.2K-bits/sec.

Menus cater for both casual and regular users. Users who require access to only one service, perhaps on a contention basis, do not need to learn any special access techniques. A 500-port MS-7000 costs about $A225,000.

Case UK holds a minority shareholding in Case Australia, and these units come through the UK affiliate.

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Tyree tries out local area net exchange

TYTEL Pty Ltd has developed a local area network exchange (Lanx) which is said to bypass the need for a central PABX switching system by placing intelligence in telephones that in turn becomes the switching mechanism.

Managing director Chris Tyree said distributing intelligence in this way has a number of advantages over conventional centralised PABX systems.

- The Lanx avoids the complications inherent in setting up a PABX, maintaining the system and catering for changing requirements.
- If a PABX breaks down, a major part of the telephone extensions could be affected, but with a Lanx the failure of one telephone does not impair others.
- The Lanx is modular, accommodating growth of the network whereas a change in the telephone population using a PABX could mean a new PABX.
- It is cheaper to manufacture than a centralised PABX and handles both voice and data.
- Each telephone on the Lanx has a help facility if required for such functions as transferring calls or telephone conferencing.

Tyree said Tytel began working on the Lanx concept four years ago but it was not until two and a half years ago that the solution to mixing voice with data "fell out of the air".

The problem was a lot harder to solve than Tytel's design engineers originally thought, believing an RS232 interface on each telephone would be the answer.

However, software required for data transmission was totally different from that for voice, and in the end Tytel developed a proprietary method of mixing the two on the one medium, Tyree said.

The Lanx uses twisted pair cabling and can cope with up to 100 exchange lines and 300 extensions over a distance of 200m.

Tytel is now working on incorporating optic-fibre cabling and video compression techniques, and these, while not as good as conventional television, will still be acceptable.

Two US manufacturers had gone partly along the path of distributing intelligence by linking up separate PABXs with high-speed buses. However, Tyree claims the Lanx product is the first in the world to avoid the use of a PABX altogether and have intelligence in the handset.

Production is being held up by late arrival of the special chips from a US manufacturer. The transmission architecture of the Lanx came out of work on the use of the radio spectrum for connecting devices in the office. However, while the problem of interference is a hard one to crack for a "wireless" network, Tytel will again resume work on this project as it could be of advantage for remote offices.

Another new product is a Telephone Information Management System based on a personal computer which besides monitoring telephone usage, can also handle security application.

Tytel is in dispute with Telecom before the Federal Court, alleging that Telecom has violated the Trade Practices Act. Telecom has refused to grant approval to Tytel's 737 Secretarial System which in handling calls for up to six executives, acts as a mini system within a PABX.

Tyree believes Telecom will treat the Lanx as a PABX instrument when submitted for approval. At present, Tytel is delivering 5000 telephones a month.

IBM boosts VM with SNA support

IBM has boosted its Virtual Memory (VM) operating system with the advanced networking and addressing features of its Systems Network Architecture (SNA), letting VM users create larger networks formerly available only with IBM's transaction-oriented MVS operating system.

"IBM has finally got VM up to snuff with other communications products," said one DP executive who had begun to reach the former network address limits of VM.

Specifically, the new releases affect use of extended network addressing and SNA Network Interchange (SNI) on SNA networks running VM.

Extended network addressing expands the number of logical units that can be included on an SNA network from 64,000 to over eight million. SNI allows multiple SNA networks to be lined together, according to IBM spokesmen.

The new VM networking capabilities are the result of Advanced Communications Function for Vtam (ACF/Vtam) Version 3 Release 1.1 announced in May.

Before release 1.1, MVS had to be installed as a guest under VM to enable users to take advantage of the MVS networking features.

Some large VM users said they liked the new Vtam capability, while others said they will continue to use VMS as their network operating system, running VM as a separate system alongside it.

VM traditionally has been used more for program development than for transaction-oriented networks. All agreed, however, that making ACF/Vtam Release 1.1 available was a sign of IBM's commitment to VM, which enjoys a strong customer base.

In addition to extended addressing and SNI, IBM included a number of enhancements for system operators.

By using a new DISPLAY command, an operator can view the specifications with which a device was added to the network when there are problems with that device.

A new FORCE command allows an operator to force the shutdown of a device on the network, then restart, rather than have a terminal sit locked up while operators search for the problem.

IBM also announced Attachment 37Plus, which permits communications and device support between a host and IBM Personal Computer AT, 3270 PC and 3270 PC AT.

The program provides access to the information, functions and facilities of the host, including file transfer, execution of host procedures and virtual disk.

CICS patch gets rid of net glitches

NEW software, said to guard against a long-standing storage glitch in IBM's popular CICS data communications monitor that causes repeated system crashes, has been offered by On-Line Software International Incorporated.

A CICS programmer can exceed memory allocation without being warned, claim users of the almost 20-year-old monitor, resulting in an overlay of whatever application or CICS control code is nearby on the disk. When the code is affected, the system crashes the next time the code is invoked, which may be seconds or even days later.

The On-line product, Stabilise/CICS, is aimed primarily at CICS production environments where system operators have been forced to waive automatic crashes induced by the operating system when an overlay is about to occur.

According to the vendor, the operating system crash was IBM's way of preventing storage violations, but production environments sometimes cannot afford the more frequent system outages that result and therefore operate in what is called a "non-protected" environment.

IBM did not immediately comment on the claims by On-line and users.

Stabilise/CICS is reported to be able to detect the CICS signal to the operating system that calls for an automatic crash, and activate substitute procedures. One is to inspect CICS control modules for corrupted code. If one is found, it is replaced by an untainted module and CICS continues operating without interruption, the vendor claims. The software also monitors CICS for loops, another cause of CICS crashes. Instead, the new product crashes the offending application and invokes standard CICS recovery routines.

Com-pose launched

SOFTWARE AG has announced several communications products to complement its Adabas database management system, including Com-Pose, an online environment manager for MVS and Dos/VSE users running CICS, TSO or CMS. Com-Pose is also said to act as the central communications manager for the company's office automation and development centre products.

It also announced third-quarter availability of Net-Pass, an application session manager that lets users conduct several logical sessions from an IBM 3270-type terminal. Net-Pass is said to work on mainframes running MVS/XA, OS/VSI and Dos/VSE systems.

THE MODEM WITH THE LOT

One DPX-224 replaces 4 ordinary modems.

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Alcan is getting its sums right now

By Noel Bennett

GRANVILLE, NSW — Alcan Australia Ltd, a major pioneer of the aluminium industry in Australia, both in manufacturing product and in alumina refining, is now getting its computer/communications sums right.

The company, with a majority ownership held by Alcan Aluminium Ltd, Canada, first entered the Australian market in 1936 as an importer. It is now engaged in casting, rolling and extrusion operations and operates a foil mill and a smelter. In addition, the company holds a more than 21 per cent share in Queensland Alumina Ltd, operator of the world's largest alumina refinery.

However, as with many other companies, particularly manufacturers, it was only comparatively recently, some nine years ago, that a computer services division was formed.

Previously, each division was "doing its own thing," according to manager, technical support, Garth Blackman. The absence of a single umbrella organisation resulted in a diversity of incompatible equipment and hence inefficiencies.

By 1981, the company was operating two DEC 11/70s, the first of its Dec Vax's and a Univac machine at the Granville site — the company follows a physically centralised computer operations philosophy.

Hardly any links

The Granville site then had almost no data communications links with Alcan's extensive operations throughout Australia. The network comprised 1200 bits/sec point-to-point lines to some Sydney operations and a few Timeplex statistical multiplexers handling traffic between Granville and Victoria and Brisbane.

However, a new solution was required, as with more applications being run on increased numbers of computers, the multiplexers could not handle the increased traffic.

In 1982, the most effective solution then perceived was to instal Racal-Milgo Omnimux 32-channel multiplexers. Alcan standardised on these products until the end of 1985.

However, during 1984 the company began to study its long-term needs against the background of the terminal population having grown from four to 400 units over eight years, with each hardwired into a specific port on one of the Vax machines and the overall system having become choked up.

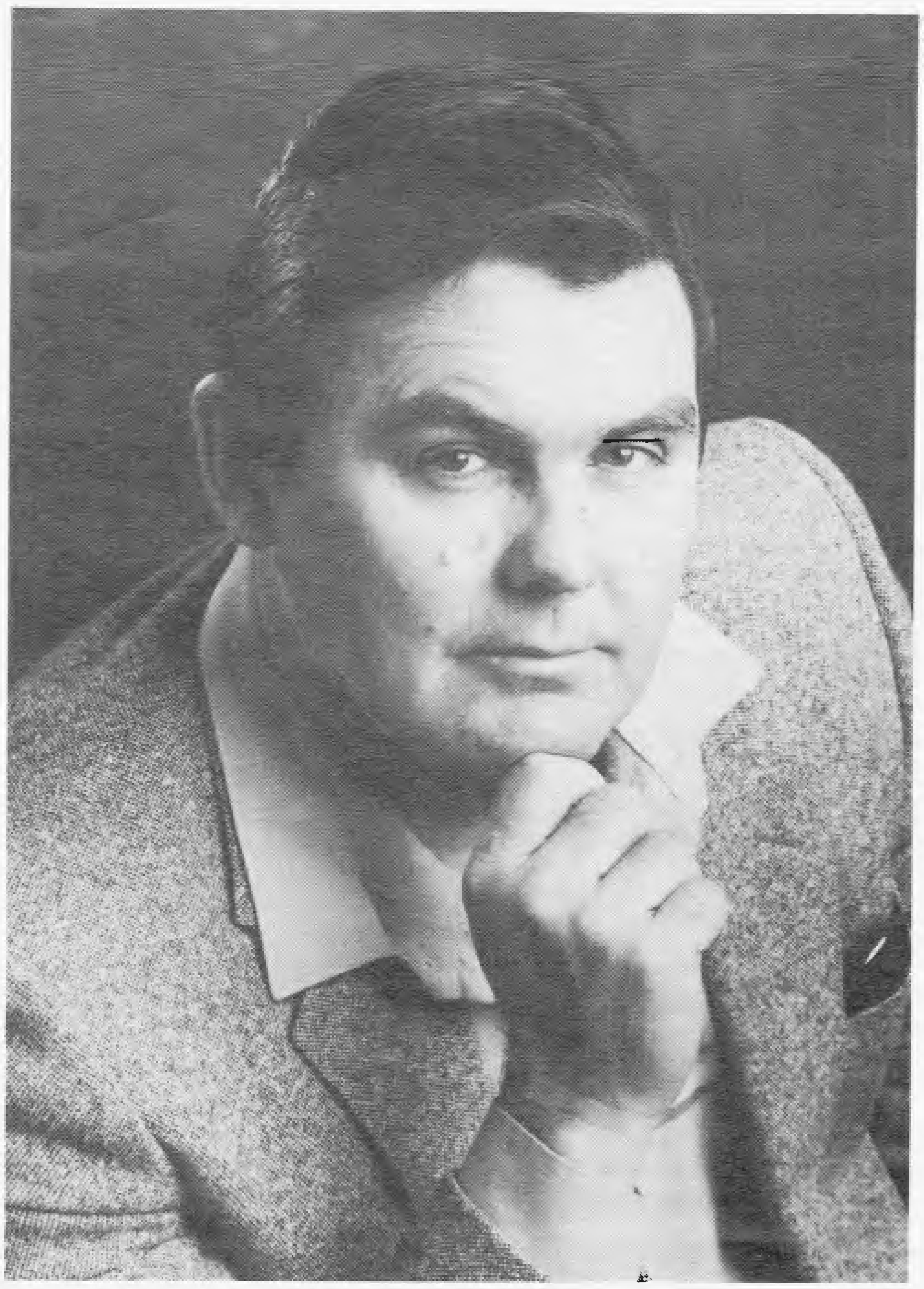
Blackman said the networking arrangements also led to slow recovery procedures if one of the interconnected Vaxes failed. Further, the cable wiring had become physically "messy" with the increasing numbers of terminals online.

In the network itself, inefficiencies were also apparent. For example, of the six DDS lines going into four places in Melbourne, two lines went into each of two locations due to the capacity limitations of the multiplexers. Also some of the older multiplexers were creating servicing problems.

Other constraints were that local subswitching could not be provided and alternative network links could not be used as the multiplexers operated in point-to-point mode.

The study had in mind how best to meet the following objectives:

- Port switching.
- Remote concentration.
- Alternative communication paths, that is, rerouting capability.
- Unrestricted capacity for any future expansion.
- Proven and implemented technology and any new equipment or techniques to be installed progressively.
- Ready availability of hardware and the presence of a competent local service organisation.
- Ability to connect remote passive devices such as plotters. Adequate throughput rates.
- Guaranteed connection at all times for users having critical needs.



Garth Blackman . . . *"computer power only where benefits are tangible".*

> *' Absence of a single umbrella organisation meant inefficiency '*

These characteristics were deemed to be essential if all anticipated problems were to be adequately addressed.

Consideration was also given to the impact of the network on the hosts, such as consumption of CPU power.

As distinct from these "musts", the study came up with desirable characteristics:

- The ability of the old networking arrangement to co-exist with any new developments.
- The general ability to provide a single solution which could meet any new requirement.
- The solution should be able to encompass any second computer location.
- The capability of incorporating new Telecom developments.

Blackman's final recommendations for the networks — covering local switching within remote sites and local and wide-area connections — were that Alcan should progressively convert the point-to-point statistical multiplexers to packet-switching multiplexers, that the appropriate equipment, Tellabs, be purchased from Datacraft and that the new network should be installed progressively.

Packet-switching was chosen as it met most of the stated criteria. However, this solution did not solve the computer processing power problem and, although comfort could be taken in the falling cost of this power, it remains one of the things "to be desired".

On the other hand, while implementation of DEC's Ethernet might have solved this particular problem, this terminal connection technique had its own restrictions and limitations.

The present centralised computer operation comprises seven DEC Vax machines linked by a CI bus and supporting terminals in Victoria, Brisbane, Adelaide, NSW country and Sydney suburbs.

At present, only one Vax has been wholly converted to packet switching, while others have some connection. Further conversion is planned for this and next year.

One of the big advantages seen as coming from the decision will be the ability for terminals in one place to connect through the network to specialised computers and other terminals within that location as well as connecting back to the Vaxes at Granville.

Auto-dial modems attached to the network would allow easy access to OTC's Midas system from anywhere within Australian operation. The carriers for the network are a mixture of 4800 and 9600 bits/sec DDS lines for every installation outside the Sydney metropolitan area with the exception of the Kurri Kurri smelter plant, still connected via Datel as DDS lines are unavailable.

On "office automation", Blackman said the company's attitude was to introduce computer power only where tangible benefits were discernible.

While Alcan was moving towards a centralised word processing facility on the Vaxes and electronic mail was also available, the company was treading lightly in this area, he said.

Helpful

Blackman said it would have been helpful if facilities available now with Ethernet had been there in 1985 when plans were being laid, but essentially, nothing that had happened in the past 18 months had caused the original planning decision to be reviewed.

The fall of the Australian dollar against the US dollar and the accompanying rise in the cost of equipment had meant that despite a fall in the cost of DDS lines, what was economical last year was not necessarily so today.

However, due to the increased amount of business in Western Australia, Alcan was reconsidering a decision made last year not to run lines into Perth.

Overall, Blackman said, the new network was economical, efficient and flexible enough to respond to changing needs very quickly.

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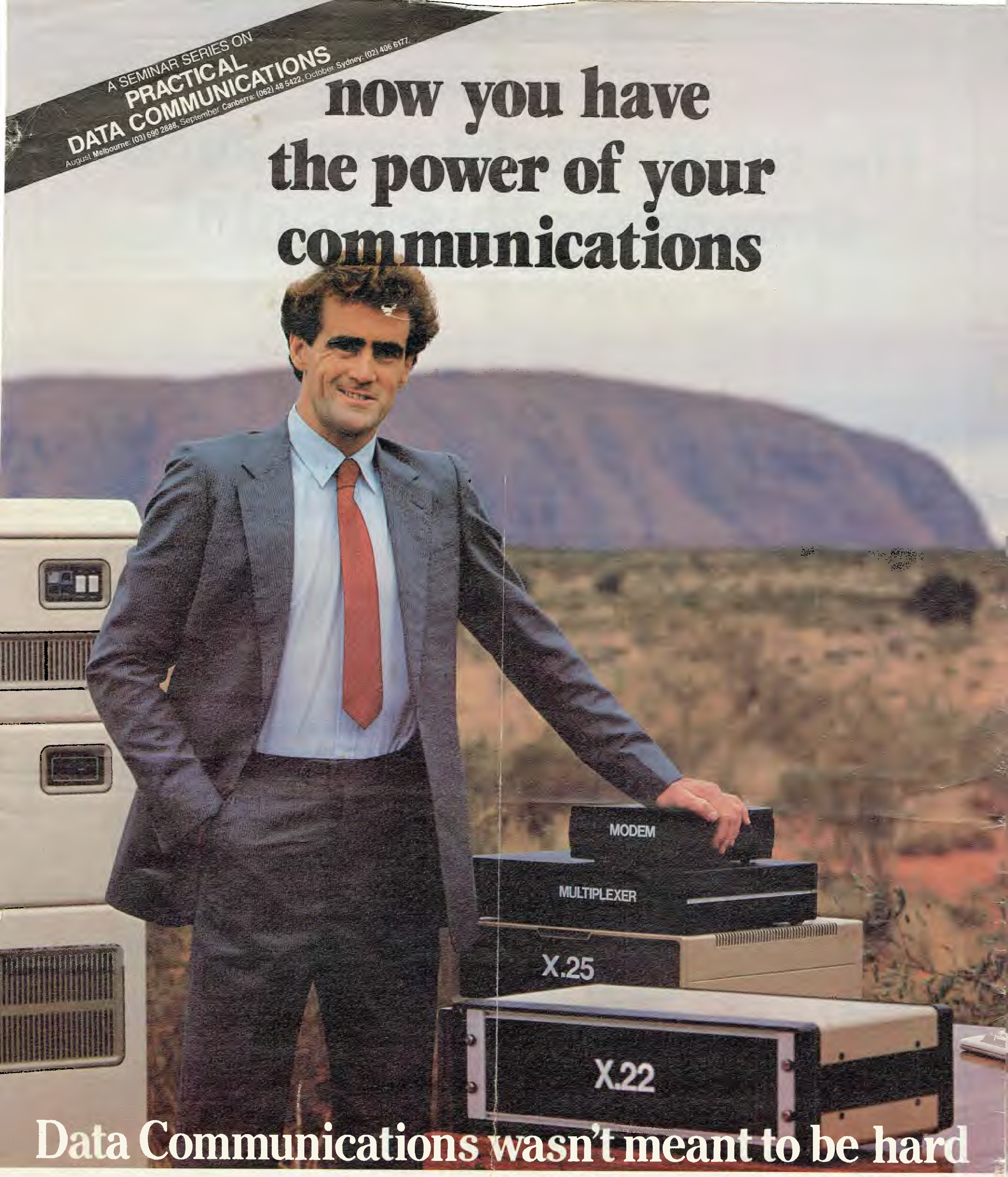
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